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## REHABILITATION.<sup>1</sup>

By HOWARD A. RUSK, M.D.,

*Professor and Chairman, Department of Physical Medicine and Rehabilitation, New York University, Bellevue Medical Center, New York City.*

It is a great privilege for me to be here tonight, not to address you, but to talk with you informally about some of our mutual problems. I feel at home in your country. I have been on many missions throughout the world, and never before have I felt in coming to a country that here is a place where you could stay and be happy and, as we say in the United States, be "home folks". I want to talk to you tonight about rehabilitation, which is a very poor word to describe the programme that I want to talk to you about, because it literally means returning one to his former state; that is a pretty sad objective for the child born with cerebral palsy or congenital club foot or *spina bifida* or what have you. That is why we do not use the term much in our programme any more. We talk about the third phase of medical care—the first obviously being prevention, the second definitive medical or surgical care, and the third that phase between the bed and the job. It

is what happens to the severely disabled patient after the fever is down and the stitches are out.

The problem is one that we have created medically. Every one of you in this room, whether you are doctors or co-professional personnel, is responsible for the problem that we face today, because with all the medical advances that have been made in the last two decades, which have been more than in all time heretofore, we have created the problem of chronic disease and disability in an aging population. Your problem in Australia is very little different from ours in the United States. Your life expectancy (I do not know what it was in 1900—ours was forty-six years) and ours are practically the same today—that is, seventy years. This longevity becomes a problem of chronic disease and all the disabilities that come with the degenerative diseases about which we know so little as to aetiology and treatment. Until we get an answer to arteriosclerosis, degenerative heart disease, osteoarthritis, the only tool that we have is a dynamic approach to these problems. That is what I want to talk to you about, first philosophically and then specifically in relation to the management of patients with two types of disability—first the paraplegic, and secondly the hemiplegic. But first, what is the problem? The problem is little understood by either the profession or the public, generally speaking.

I do not think you can blame us too much for not having paid attention to this phase of medicine in the past, because we have had to focus our attention on the problems of infectious disease, acute illness and the drama of

<sup>1</sup>An unedited transcript of an extemporaneous presentation to a meeting of the New South Wales Branch of the British Medical Association and the Post-Graduate Committee in Medicine in the University of Sydney on November 2, 1956.

intricate diagnosis, and the patient left with the disability or in the convalescent phase has been left to drift more or less on his own while we went to more important tasks. That is not true any more.

Someone has said that a man in general medicine spends 20% of his time dealing with the problems of organic disease, and 80% of his time in chronic disease and psychosomatic problems. I think this is probably a very conservative estimate as to time.

When you analyse the problem that exists today, I think the first thing you must consider is the problem of age and how foolishly we have attacked this specific problem. It would be an insult to the intelligence of anyone in this room to say to you that age is chronological, because everyone knows that it is physiological—that some people are old at fifty and others are young at eighty. And to take this specific date on the calendar and turn the page, and say you are able on one day and unable on the next is totally foolish. I do not know where we got the magic age of sixty-five. I said at a meeting yesterday, and I have said many times before, that the most logical reason that I can think of is that some board of directors at some time around the turn of the century, probably in my country, had their annual meeting. The president was very unpopular and a tyrant, and someone remembered that this was his birthday and he was out of town, so they passed a resolution that there would be compulsory retirement at sixty-five. It is the most logical reason that I can think of. By such a rule, I think that we are wasting the most precious human resource that we have—and that resource is wisdom, because people are not born wise. You may be born brilliant, but wisdom comes only with experience, and experience comes only with time. One of my colleagues in the United States, Morris Piersol, gave us the mission most neatly when he said: "We have added years to life—it is also our responsibility to add life to years."

We can well turn to overseas—over your seas, over our seas—to get some ground rules. I will take you first to the middle of The Hague, right in the middle of town. I should like to take you there at dusk (it is the first time I went) to see the apartments which surround the courtyard, all the same size but all different, because the old people have brought with them their pillows and their rugs and their chairs and their pictures and all the things which made this home. Out in front you would see a little square twice the size of this lecture, and in it would be a garden; and every garden was different, because it was the garden of the individual who lived in the apartment. I remember one had nasturtiums, and another had two rose bushes, and yet another had three stalks of corn growing. That is the way you feel in Australia, and we feel the same way in the United States. It is a happy place, and going out I saw an inscription over the door which said this: "Established in 1692." I think you might well visit a place or two in your part of the world—Korea, where no decision is made without the "Papasan" and the "Mamasan" being consulted, because they are wise and they have the experience. I think that any country like yours and like mine could solve the secrets of electronics and radar and atomic fission. But to say that we can set up the ground rules, and make the decision or give the advice as to who should work and who should not, to their own detriment or that of the fellow worker, is saying something that is not true. The tools, crude as they are, are in our hands today. The problem is here. It is our problem today; it is the problem of medicine in the future.

But it does not stop with old people. Children who in the past would have died do not die any more. I think, as the best example, of the child with *spina bifida*; in the past, in the pre-antibiotic days, such children were no problem, because they all died within a period of a few weeks, months or years, from ascending meningitis. You remember how we worked so strenuously with transfusions and all these things when it happened, and then piously said, when they all died: "Little John or Mary is better off, it's God's will." Well, it is God's will if they do not die any more. They are little paraplegics—two-thirds of

them with fine minds and strong hands and the desire to live the best lives they can with what they have. We have just finished analysing our first 50 children over a five-year period, and 35 are in school and are growing, and are "dry", with automatic bladders, and are living relatively normal lives. So children have the right to ask you: "You saved us—for what?"

The same is true with the civilian disabled. Those who in the past could not have been a problem to you are problems today. That is what this rehabilitation business is all about. It is the programme designed to meet the needs of these people. How does it work? Well, it works very simply. It works in the same pattern as that in which we have always practised medicine. We started the first programme in the general hospital (any general hospital in the world) just ten years ago, and we established it as a service department just like the laboratory and the X-ray department. We said to all the other specialists in medicine: "We are here to serve you, we are here to provide a training programme for your disabled patients that will allow you to get them back to the best lives that they can live." There were just two considerations—first their disability, and, much more important, their ability.

In the definitive phase of medicine, we have acted as the consultation service in Bellevue for many years now. We see all elective amputees before the leg is amputated, and we tell the patient why he cannot keep his stump up on a pillow. It was common practice in the past. If you keep a stump on a pillow for a week, it will take you eight weeks to get the flexion contractures out. We tell the patient why he should take certain exercises, and why he should be on his abdomen for a certain period of the time, and what an artificial limb is. To some patients we do not talk about it at all. The older patient with questionable circulation in the other extremity and borderline decompensated heart we begin to talk to about full life in a wheel-chair, because if you infect him with the feeling that a prosthesis is the alpha and omega, you may have to fit him knowing that you are fitting only his head, and that he will never be able to walk on the artificial limb. We talk about shrinkage of the stump and all those things before the leg is amputated. Then, when the stitches are out and the operation is over, the patient comes to the ward for first training in crutch walking, and then for fitting and training in the use of a prosthetic device.

Our relationship with the practitioner is just the same as it is in any other speciality reference. The patient remains the patient of the doctor who refers him. I think radiology is the most understandable analogy. If you send a patient to the Roentgenologist for deep X-ray therapy, you do not tell him the dose. You give your diagnosis which he denies or confirms, and if he confirms it he gives the dose which is enough to meet the pathological necessity for the individual patient. If the patient is burned, it is the radiologist's responsibility. If he gets a good result, it is his victory. The patient has medical problems during the treatment; they are the problems of the referring physician who sent him. When the patient finishes his treatment, he goes back to the doctor. That is as simply as I can say it. Those are our professional relations.

When a patient comes in, what happens? Well, we are a professional and not a technical service, so we reserve the right to examine our patients and either confirm or deny the diagnosis, because our reputation stands on what we can produce in a training programme. We do not accept patients any more than a surgeon does when, for example, a patient is referred with the request: "Won't you take out this man's gall-bladder?" You have to be sure.

I will give you a good example:

At the Institute about three years ago appearing on our doorstep one morning (and we do not take patients except those referred by physicians) was a clinical psychologist from a neighbouring city with her son, sixteen years old and six feet two inches in height. A year before he had been in a terrific automobile accident and had a macerated brain. He had been unconscious for five months and tube fed. He had undergone two craniotomies. When he began to awaken he had very severe cerebellar ataxia and severe

aphasia. He was sent to a local rehabilitation centre; braces were applied, ten-pound lead weights were put in his shoes in order to stabilize his gait, and he was in a speech programme twice a day; he bitterly complained, and so did his mother time after time, that he could talk much better if he could just be able to breathe better. And he was told time and again that this was a severe injury and it took time and patience and that they were unreasonable, and so forth.

This went on for six months, and he came on that morning to the Institute, and because his mother was a professional person we accepted him. The doctor in going over him was interested in noting on the original physical examination that he had dextrocardia, and that his liver was in the proper place, and also that there were more intestinal sounds in the left side of his thorax than there were breath sounds. To make a long story short, he had a diaphragmatic hernia, and about half of his intestinal tract was in the left side of his thorax; and walking with ten-pound leads is not specific for diaphragmatic hernia. So he was sent back to the surgeon, and the rent was repaired, and strangely enough the boy could talk a good deal better after that was done.

We saw four patients with the same problem after severe trauma in a period of six months in our departmental service. So that is first.

Secondly, we carry out a very highly definitive test of muscle power and range of motion; but the heart of our programme is the simplest thing in the world. We test these patients for 137 inherent needs in daily living: "Can you brush your teeth?" "Can you comb your hair?" "Can you feed yourself?" "Can you shave?" "Can you put on lipstick?" "Can you turn in bed?" "Can you dress yourself?" "Can you put on your own braces?" "Can you get from the bed to the wheel-chair, wheel-chair to toilet, toilet to wheel-chair, wheel-chair to bathtub, bathtub to wheel-chair?" "Can you walk?" "If you can walk, can you get up and down an eight-inch curb?" (If you can't, you're home-bound.)

I will give you an example. My associate Dr. Deaver, some years ago, carried out a follow-up study on 500 patients with poliomyelitis who had been five years after the original attack, who were sixteen years of age or older, and all of whom came from three of the best clinics in New York and were all home-bound, to see whether or not there were some that, with adequate programmes, need not be home-bound. In the 500 he found 70. We took the first 25 into Bellevue.

The first patient we took was a girl, aged thirty years, who had had poliomyelitis at two. She was a quadriparetic and had practically nothing in her back. She had had 26 assorted surgical procedures, including six spinal fusions. She could walk with a crab-like gait on crutches, she could not get up and down a curb, and therefore she had had a home teacher. She graduated from high school with honours. She could type 40 words per minute, but it did her little good because she could not get out of the house, she could not get in a car, she could not get across the street, so she stayed at home for twenty-eight years.

It took seven months to teach that girl a technique by which she could get up and down the curb herself. We had to reeducate and redevelop every ribbon and trace of muscle that she had, and then work to find an engineering process by which she could get up using gravity as her friend. The doctors did some, the nurses did more, the therapists did more, the patient did even more, and she did the most herself. I was lucky enough to be in the gymnasium on the day when she accomplished it the first time; it was by throwing her leg back at a certain angle and catching the heel on the curb, and then with a turn—up she went. The patient screamed like the people in Melbourne will scream who have money on the Cup race on Tuesday. Once she learned the trick she did it a dozen times that day, and 50 times the next and 100 times the next. That was Friday, and we discharged her. On Monday morning she took a full-time job, on the switchboard at Bellevue; she has been there seven years. She has never been late a morning, she has never missed a day; but she waited twenty-eight years because there was an eight-inch wall around the house.

You see, this is a programme of a lot of little things. You do not have to know any five-syllable, \$64,000 words. You just have to be meticulous about detail and have a great desire to carry people as far as they can go.

In addition to what I have described, our patients are screened psychologically, and our social service worker

sees them, and then they come before an evaluation clinic where all the disciplines sit—doctors, nurses, therapists of all descriptions, teachers, psychiatrists, psychologists—and we hear the case and plan the programme. Then these people go to work on a five hour a day programme designed to meet their specific need. We keep them till they have reached the maximum improvement, and we send them back to the best place in life that they can attain. That is as simply as I can tell you about this programme, which has a big title, but is the simplest programme in the world.

Now I want to tell you about two specific conditions and some of the things we have learnt about them, and the first that I should like to talk about is paraplegia.

In the past pre-antibiotic days paraplegics presented no problem, because—well, I will give you our own experience. In World War I we had 400; one-third never got back to their country; one-third died within the first ninety days; the remaining 25% of the one-third died within the first year. There are only two living today, and they were partial paraplegics. They died with kidney infection and bed sores; they died of lack of understanding. In World War II we had 2500; this time they did not die. We knew a little bit about their kidney management. We had antibiotics. We knew a little bit more about the management of decubitus ulcers including the nutritional problems. And here were young men who had given the best of their lives and most of their bodies to their country, with good minds and strong arms and their life before them; and they wanted to live the best life they could. I can tell you today that out of the original 2500, 1763 are living in their own homes and driving their own cars. A large group are married, and more than 1200 are at work.

It may interest you to know that in our own veterans' hospitals the case-load has increased rather than dropped, because for every trained service-connected paraplegic who has left hospital, one has come back owing to some injury or disease in civilian life—because we have learnt, as you have learnt, that disabled civilians outnumber disabled veterans by ten to one.

I want to tell you a little bit about the management of the paraplegic. Do not believe what you read in the text-books. The text-books say that anyone suspected of having a spinal cord injury should be transported in hyperextension. I can cite to you nine patients whom I know of who have had their spinal cords transected in transportation. The first was a young naval officer, who crashed his plane, and walked away 100 yards and sat down on the grass while it exploded and burned, and while the ambulance came. But the book said "transport in hyperextension", and he was forced in hyperextension. He describes how in a half-hour ride to the hospital his legs went to sleep, and when they lifted him into the bed he was paralysed. I am sure that his spinal cord was transected *en route*. As I say, we have had nine such patients. You transport them as they lie. You transport them on a hard surface. And you do not have to have any fancy equipment, because you can take a door off the hinges—which is probably the simplest and the easiest. You take them to the X-ray department on the door, and you take the pictures on the door, and you do not start to posture them until you know what posture is proper. That is the first consideration. The second is that the first forty-eight hours are the crucial ones. The great shock that comes, the spinal shock, is especially terrific in young individuals with very active endocrine systems. Any of you who have seen many spinal paraplegics have sometimes noted within the first twenty-four hours a blush on the skin of the back, regardless of the fact that the patient has been reasonably turned; and if you see it, it is the kiss of death as far as training is concerned, because you know that within seventy-two hours you will have an area of necrosis, and then you really have a problem on your hands. We know the hypoproteinemia, the inversion of the ratio. We know that this is the important time to get protein in in any way that you can, with all of the anti-pressure measures that can be taken; otherwise you are in trouble. We know,



too, that no one physician can manage the complicated problems of the paraplegic in this stage of the game.

We in our centre do not believe that any paraplegic, except those in whom the damage is in the cervical segment (and those should be given the privilege later) should be denied the privilege of laminectomy. We see in our centre about 20 patients per year in whom even late laminectomy provides some return of function. Maybe there are some skilful enough to do it, but all I can say is that we are not. We are able to tell by physical examination or X-ray examination whether or not a cord is truly transected, and with good neurosurgery the danger is practically nil. We have never had a death to date with exploratory laminectomy, and we feel that the patient has that right; we also know that if you perform laminectomy early, and you can save the patient at the appropriate time, his spinal cord is saved. Under present knowledge there is no way in which it can heal and function. I cannot tell you whether, with all the research that is going on, there will be a method devised whereby it can heal and function next week or next year or ever. I can only tell you that you can sign your own Declaration of Independence if you are willing to come in, and train, and work, because we know the techniques with which it can be done. You start from there, and then it is a long, patient programme of developing the upper limbs with which this individual will walk, and of bladder training and teaching the individual to walk, and of posture and proper bracing, of balance in crutch walking, of the activities of daily living, of bowel management, and of learning to drive an automobile. I can tell you this—that if you will follow a programme meticulously, more than 75% of the paraplegics will go back to work with bladder automaticity and bowel control, and will be able to live normal, dignified lives.

Do not be too hasty about telling your patients with transected cords that they should never marry, or can never have children, because you cannot make the prognosis accurately. Dr. Guttman will tell you that when he comes here on his visit. He has documentation of more cases than anybody in the world. We have a good number. But these individuals can procreate, they can have happy married lives; and be awfully careful about how you recommend that they should not have this privilege. Neither is quadriplegia a totally hopeless thing. The day I made rounds before I left, we had 16 "quads" in the house. Unfortunately they were mostly the younger individuals. In 80% of cases the damage is between the fifth and sixth cervical vertebrae. There are both anthropological and anatomical reasons why this happens. It is a bad place. It catches all or part of the finger flexors. It always catches the triceps. It preserves the biceps.

But do not forget that Nature pays today for two things—the skill in your hands and what you have in your head; and if you have only this, you have much to work with. We have one inviolate rule at the Institute, and that is that no one is allowed to tell the patient what he cannot do unless he has been given an opportunity to try.

We had a "quad" in the house in 1951, a boy from a poor family from Vermont, which is in the north of our eastern seaboard. He broke his neck in a driving accident. He was the patient with the highest fifth over sixth cervical lesion whom I have ever seen recover. He had absolutely nothing in his hands, and the terminal phalanges on both hands were gone when we saw him, because he had terrific spasms. When he got the spasms, he learned that he had a biceps, and that if he could bite his finger he would stop the spasm. So he had bitten his fingers to the degree that he had gotten gangrene in all his terminal phalanges and lost them. He came in, this boy, and had only one desire in the world. He had accepted the fact that he was to be paralysed. He wanted to paint; he had never painted before in his life. Following the rule, we devised a double strap which went around his elbow with a paint-brush holder in, and we put him up on a tilt board, and we got him some paints, and we got him an easel, and we put a paint brush in and we said: "Paint." The first six paintings we had seen by an art critic in New York, who said that the boy had real basic talent. A friend gave him art lessons. He sold his first six paintings for \$600. The family bought a trailer and went to Florida.

This was in 1951. This boy is now more than two-thirds of the support of his whole family, painting oils with his elbow.

I could cite you a dozen cases similar, in different fields, if time permitted. So, this is a victory in the field of spinal paraplegia, using the simple tools that we have. All of us hope that one day we shall find a way whereby the spinal cord can heal and function. There is a lot of research going on now, in which you can keep down the fibrosis and get neurilemmal regeneration in animals—no function yet, but maybe one day the extra key will come.

The other group about which I should like to say a word is the largest group of all in this field—the hemiplegics, really the forgotten men. We have 1,500,000 hemiplegics in our country. We have 11,000,000 individuals with cardio-vascular disease. In the past we have sort of taken the attitude that "poor old Joe has had a stroke—too bad—he's all washed up". It is not true. We have just finished an analysis of our first 1000 cases at Bellevue. The average age was sixty-three years. The average time from stroke to training was nine months. The earliest was three weeks. The longest was twenty-one years. Of the patients 50% were aphasic. The average training time was seven weeks. Nine hundred of the 1000 we were able to teach to be completely adequate in the activities of daily living, and 400 went back to some gainful work. Many of these were housewives. Some were old gentlemen who dreaded to go on relief because of their pride and self-respect, and who learned to do housework so that their wives could be free to go back to work.

The management of the hemiplegic has been pretty well documented. Of these individuals 90% are thrombotic. In the thromboses we believe in early ambulation, just as we do in surgery, for a number of reasons. You cannot employ early ambulation in haemorrhage. In the first place the mortality rate is some 80%, and in the second place the patients are in severe shock over a period of three, four and five weeks, and you cannot get to them. Of course, you cannot employ early ambulation in the embolic phenomena if there is contraindication from the basic form of the emboli; but I am talking about the garden variety. There are simple rules, and if you follow them this is a very easy procedure.

This brings me to the point that I feel very deeply about: I think that 80% of all rehabilitation is the practitioner's responsibility, and if he would take time to read the literature and to learn the techniques, and would give the time to his patients, he would do it perfectly adequately. I think there should be a rehabilitation section in every general hospital for the garden variety of patient. I think just as deeply that for the 20% of severely disabled there has to be a specialized centre, where you can have the team approach of the doctor and the therapist and the teachers and the specially trained nurse and all the other co-professional people that are required.

But the average garden variety of hemiplegia is a simple thing. The patient is unconscious, and I cannot talk about the medical management. I wish there was time. There are two simple things that you do. In the first place you put sandbags on the outside of the affected leg so that you do not get external rotation. You put a small pillow in the axilla and sandbags on the outside of the affected arms so that you do not get external rotation of the shoulder. You teach the family to take the affected side through the normal range of motion 10 times, three or four or five times a day. If you have a physiotherapist, it is wonderful. If you have a nurse, it is good. If you do not have either one and the patient is at home, you can teach the family. There is no excuse not to. When the patient becomes conscious, let him hang his feet over the side of the bed the first day that you can. Do not keep him down until he gets all the deconditioning phenomena of bed rest, which are so well documented in the literature, and which mean just another three or four weeks to get the patient back to the point at which you can train him. If you see a hemiplegic and ask him to bring his feet up in bed, and he can do that, you can say without any further examination that that patient can walk. We know a lot more now about coordination exercises of the arm. We know about reinforced exercises which come from the



other side, and which will provide automatic motion on the affected side. We know that the leg comes back in 90% of cases more quickly than the arm. We know that the hand is difficult to rehabilitate, so therefore, although we continue to work on the hand, we disregard it as far as function is concerned, and feel that everything we get back is just that much "gravity". We tell the patients that.

If you see a patient who has had a stroke and he becomes conscious and is aphasic, I plead with you to do one thing. As soon as you feel you are getting through, sit down by the bed and take him by the hand and say: "You have aphasia. You haven't lost your mind. You aren't crazy. I know how you must feel, because I know how I feel when I can't remember a friend's name, and I know as far as you are concerned this is multiplied by infinity. There is a way that you can be taught to talk again. We have people to help you. I understand." I say this simple thing to you because we have seen case after case in which no one had sat down and taken five minutes to explain this fundamental situation to the patient, and we have heard patients describe the agony which they underwent because they did not know.

When your patient is ready to get up, do not get him up in a walker. Do you want to know the reason why? When you leave here, try to walk to your car with your hands tied to your side, and see what difficulty you have. Hemiplegics have to be taught reciprocal gait pattern just as you walk—hand and leg in opposition. We think the most valuable piece of equipment in a rehabilitation centre (and I may say here that a rehabilitation centre does not require a lot of fancy equipment—it requires dedicated hearts and trained hands and simple equipment) is a pair of parallel bars that a plumber can make, in which a patient can stand and learn balance and then learn a reciprocal gait pattern. It is a most valuable piece of equipment. If you are at home and do not have it, you can take two kitchen chairs and place them one at either side of the patient for him to rest on, and move them in a reciprocal motion. You will find that two-thirds of your patients with hemiplegia will need a short leg brace with a 90° stop. If they are spastic and have a tendency to clonus, you know that 90% of the clonus impetus comes from the toe, so you put a 90° stop on, or you put a little quarter-inch piece of board under the ball of the foot, so that you do not get the toe hit with the impetus coming back, and you will take care of 90% of your clonus within two weeks.

Make your patients walk with a bent knee, because if you do you will find that, even if they cannot flex and bring their foot up, if you bend their knees you will find that the toes come up automatically. It is one of the most primitive reflexes. It is a climbing reflex, but the patient comes down on stairs, so put a short leg brace with a double bar and a 90° stop, and make the patient learn to walk with a bent knee, not to circumduct. Patients can never learn to walk properly with circumduction and get the benefit of an automatic reflex; if they are trained in the way I have described, they will get stability and many of them may lose their brace.

There are only three contraindications to the training of the hemiplegics in our Institute; one is cardiac, or lack of cardiac reserve that will not let them take on this additional work. The second is malignant hypertension, uncontrolled, in which the mortality is so high and the life expectancy so short that it is not worth while. The third is brain damage, to the degree that the patient cannot remember today what he learned yesterday. You cannot carry water from the well in a sieve. But be very careful about making the prognosis in the first eight weeks, because the oedema is still there, and if you say that so-and-so can or cannot in that period of time, then you will make mistakes that you will rue. I say this very feelingly, because we have made many, and now we will give anybody a trial in the first few weeks and then make the decision later, and we have lost nothing more than two or three weeks of time.

I say to my Freshman class each year when I talk to them: "If you only learn one thing in the time spent in

our department in the four years, as far as I'm concerned your time will be well spent, and that one thing is this: if you can get the same inner satisfaction out of taking an old hemiplegic out of a wet bed and teaching him to walk, and to be dry, and to live the best life he can; if you can feel the same way inside you that you now feel when you make a diagnosis of aleuchæmia, leuchæmia or histoplasmosis (which you may see once in five years in practice, and then you feel that 'little Sir William Osler' neon halo that goes on and stays on for a week or two); if you can feel the same way about this accomplishment, then your time will have been well spent, because if you did not, 80% of those without organic problems that you see are going to bore you. The hemiplegic is going to make you feel insecure. You are going to be the blood pressure-potassium iodide-phenobarbital doctor. When this individual comes in, you put the cuff on in a hurry so that you don't have to listen to his problems, and you give the largest prescription for the smallest dose of phenobarbital which you think is safe. You don't tell him when to come back, because you don't like to feel insecure." I can say this freely, because I practised that way for seventeen years before I got into this "monkey business". Well, that is the story.

I think that, whether we like it or not, in medicine the emphasis has to change. When I was an intern, I can remember sitting at the bedside of a pneumonia patient trying to catch the sputum to do the typing through the mouse in the first twenty-four hours, and praying that it was one of the seven or nine types sensitive to serum; otherwise you fanned the patients with a palm-leaf fan and gave them plenty of water, and if you were smart you prayed, because that was all we had. And now you cure the patient often before the diagnosis is firmly made.

So my plea is that we accept the responsibility of this problem that we have created, and that we accept it with glad hearts because we have come this far on the road to victory over disease; and that we learn to get the inner satisfaction out of these accomplishments that are really due to us. I know of no greater thrill than to see a paraplegic walk out of hospital, and get into his car, and drive away to life again—or the hemiplegic go back to his job. You have a pretty good example of what a hemiplegic can do in that great man of your Mother Country—Sir Winston Churchill.

I should like to close by saying that all this is important, but it really is not so important as what lies behind it. I tried to write my own concept of this some years ago. In a series of broadcasts and a book written by a man in our country named Edward Mearl called "This I Believe", I was asked to write a "this I believe". And today, when "Suez" was on, I fished it out of my pocket, and I should like to conclude by reading it to you, because I have never felt that it was more true than it is tonight:

I cannot remember when I did not want to be a doctor, even as an adolescent when I scrubbed floors and ran errands at the local hospital in order to smell ether and go on rounds with the country doctor. Surgery did not spell glamor in medicine: to me it was people—sick people, their suffering, their problems and their victories that challenged.

It has been a rare privilege to be a doctor in medicine's golden era. Far more scientific advances have been made in the last three decades than in all times heretofore. Man's life span has increased from 18 2,000 years ago to 70 in America today. But I found it impossible to ignore the fact that these great medical advances have posed new problems. Crippled children who in the past would have died early in life now survive. They want to grow and work and love and be loved.

I have heard old people to whom we have added these years ask: For what? A shelf to wait for death or an opportunity to live and work in dignity as long as we are able? Millions of veterans throughout the world who have scarred their minds and given parts of their bodies to war, have more than earned their right to live and love and work and to know that their sacrifice has at least been one small stone that is being used to build a better world.

Sick people throughout the world ask their God: "Why must I suffer?" Possibly the answer comes in the work of the potter. Great ceramics are not made by putting clay in the sun. They come only from the white heat of the kiln.

In the firing process some pieces are broken, but those that survive the heat are transformed from clay into objects of art. And so it is, it seems to me, with sick, suffering, and crippled people—those who through medical skill, opportunity, work and courage survive their illness or overcome their handicap and take their places back in the world have a depth of spirit that you and I can hardly measure. They have not wasted their pain. Because of this experience they have a desire to share that is almost compulsive. It matters not whether they be a physician from India, a Zionist from Israel, a Greek veteran, or a Pole disabled in a mining accident—all want to share the understanding they have gained through suffering, or by helping those who have suffered.

I believe that this basic and inherent desire of man to do something for his less fortunate fellow transcends religious dogma, political beliefs and geographical boundaries. If we could only use this universal language we would have a tool to unravel the Babel of tongues, an instrument which would penetrate any iron curtain or closed boundary.

It does not seem strange to me that the sick should turn to those who have suffered for their greatest comfort. And so, in a sick world it is not strange that we turn to those who have been ravaged by suffering and disease for a common language. If we could start to work here together in a program where all of us have the same goals, it is more than possible with God's help we would find a solution for living together in peace. "This I believe."

#### RHEUMATIC FEVER: PREVENTION OF RECURRENCE WITH PENICILLIN GIVEN ORALLY.

By BRYAN DOWD AND HELEN WALSH,  
*Institute of Child Health, Royal Alexandra Hospital  
for Children, Sydney.*

WITH the exclusion of accidents, rheumatic fever is one of the commonest causes of death in Australian children. The disease is characteristically recurrent, and in most instances is preventable.

Although a number of reports have already been published on the prophylactic use of penicillin, given orally (Maliner and Amsterdam, 1947; Hofer, 1949; Brick *et alii*, 1950; Massell, 1951; Gale *et alii*, 1952; Kohn *et alii*, 1953), controlled studies over a long period are still necessary to establish the place of penicillin in the prevention of recurrence of rheumatic fever and to define optimum dosage. Early in 1952 such a study was commenced under the direction of Professor Lorimer Dods at the Institute of Child Health, and this preliminary report is published in case it may help the physician faced with the problem of prophylaxis against streptococcal infection in the rheumatic child. In June, 1956, penicillin tablets were made available under the National Health Scheme for rheumatic children aged under sixteen years. This is an additional reason for early publication of this paper.

##### Diagnostic Criteria.

The criteria of diagnosis suggested by T. Duckett Jones in 1944 have established a standard whereby results obtained in different centres may be compared. The criteria quoted below are those used in the Cooperative Rheumatic Fever Study of 1955, and have been employed throughout this survey, with a single exception.

Two groups of manifestations of the disease, major and minor, are recognized.

##### Major Manifestations.

- (1) *Carditis*, as evidenced by one of the following: (a) the development of an organic apical systolic murmur or an aortic diastolic murmur under reliable observation; (b) a change of heart size of more than 15% on standard X-ray film by any standard method of assessment; (c) pericarditis revealed by a definite friction rub or by pericardial effusion; (d) congestive cardiac failure, in a patient under 25 years of age and in the absence of other causes, and shown by one or more of the following: (i) dyspnoea, (ii) orthopnoea, (iii) enlargement of liver, (iv) basal pulmonary rales, (v) increased jugular venous pressure, or (vi) oedema.

*Significant organic apical systolic murmurs* are best heard at the apex, are long and loud, frequently occupy all or most of systole, may mask or obscure the first sound and are frequently heard through to the back. These murmurs are persistent and do not vary with the position of the patient. They may appear soon after the onset of rheumatic fever. During the acute phase the significant systolic murmur at the apex may change rapidly in intensity and character. Systolic murmurs in which there is a sharp difference of opinion as to presence or absence are rarely important.

(2) *Polyarthritides*, as shown by pain and either limitation of active motion or tenderness in two or more joints.

(3) *Chorea*, with movements of at least moderate severity.

(4) *Subcutaneous nodules*.

(5) *Erythema marginatum (or annulare)*.

##### Minor Manifestations.

(1) *Fever*, defined as any temperature above 99.3 degrees Fahrenheit, by mouth . . . occurring at least twice in one period of 24 hours, or above 100.3 degrees Fahrenheit by mouth . . . observed on any one occasion.

(2) *Elevated Sedimentation Rate*, defined as 15 millimetres per hour or above (Wintrobe, 1935, corrected by Whitby and Hines Chart to hematocrit of 45%).

(3) *Evidence of previous streptococcal infection*, as shown by culture in which beta-hemolytic streptococcus predominated, or by an antistreptolysin "O" titre of 200 units or greater, or by a reliable history of sore throat with fever preceding the onset of illness by an interval of one week to one month.

(4) *An increased PR interval*, defined as a value at least 0.04 second beyond those given in the Ashman and Hull Tables for ages under 16.

(5) *A reliable history of rheumatic fever*, as defined in these criteria, or evidence or pre-existing rheumatic heart disease—namely apical organic systolic murmur, and apical diastolic or basal diastolic murmur.

For inclusion in the study the patient shall have had: (1) at least one major and two minor manifestations, or (2) two major manifestations of the disease.

*Definition of Previous Attack.* An interval of three months of no activity of the disease after a previous attack must have elapsed to classify an exacerbation of symptoms as a new attack.

##### Comment.

The only modification used in the present study is that "elevated sedimentation rate" is defined as nine millimetres per hour or above (Smith, uncorrected) when capillary blood is used, or 16 millimetres per hour or above (Westergren, uncorrected) when venous blood is used.

##### Material.

A total of 392 patients were admitted to the Royal Alexandra Hospital for Children, Sydney, between 1951 and 1956 with a provisional diagnosis of rheumatic fever or chorea. Of these, 140 were excluded from the study either because their clinical features did not conform with the diagnostic criteria already defined, or because they were unable to attend regularly for examination.

In all, 252 children were studied; 86 of these received penicillin prophylaxis and 166 did not. Table I summarizes this material. The 252 children are divided into four groups, depending on whether they were observed after their first, second, third or fourth attack of the disease. Data concerning the 86 children comprising the penicillin series are shown in the second column. The third and fourth columns refer to the 166 patients forming the control series, some of whom received prophylactic treatment with sulphadiazine. A child who suffered from more than one attack may appear on more than one occasion in the third and fourth columns, according to whether he has or has not received sulphadiazine after one or other episode of the disease.

In the penicillin series there were 46 males and 40 females, and in the control series there were 74 males and 92 females. The average age at onset of the disease was 6.5 years in the penicillin series, and 6.8 years in the control series.



The children in the penicillin series were admitted to a single unit and attended a single clinic on their discharge from hospital. The average duration of penicillin administration was twenty-two months, with a range of three to fifty-two months. The control series was made up of children under the care of a number of honorary physicians who kindly allowed access to their patients, most of whom did not receive continuous prophylaxis. Some were given sulphadiazine, 0.5 gramme twice a day, for varying periods after their first, second, third or fourth attack. No child in the control series received penicillin continuously by mouth.

TABLE I.  
Analysis of Material.

Number of Attacks Preceding Observation.	Penicillin Series.	Control Series.	
		Sulphadiazine.	No. Prophylaxis.
1 (Group I) .. ..	68	42	124
2 (Group II) .. ..	12	24	35
3 (Group III) .. ..	5	4	9
4 (Group IV) .. ..	1	1	1

#### Method.

##### Penicillin Series.

Prophylaxis began with an attempt to eradicate  $\beta$ -haemolytic streptococci, Lancefield Group A. In the earlier months of the study, as soon as diagnosis was definite, each child received an aqueous suspension of procaine penicillin daily for ten days in a dose of 300,000 units given intramuscularly. Later, this was replaced by a single intramuscular injection of 1,200,000 units of a preparation combining benzathine, procaine and crystalline penicillin.<sup>1</sup>

Approximately one week later the administration of penicillin by mouth was begun. Tablets prepared by the Commonwealth Serum Laboratories consisting of 100,000 units of crystalline penicillin G together with 135 milligrammes of cane sugar were used. One tablet was given three times each day at least half an hour before food. This was continued during the patient's stay in hospital, at the convalescent centre and after return home.

Early interviews with each parent by the medical officer and social worker were arranged. On these occasions the objects of prophylaxis were explained and cooperation was sought. Particular stress was laid on the need for continuity of prophylaxis, and the social worker made a home visit when explanation and encouragement were continued. She supervised the supply of penicillin tablets, and whenever children were unable to attend on the due date she ascertained the reason for their absence and made a further home visit if necessary.

After discharge each patient was examined at intervals of one to three months throughout the year. If there was evidence of recent respiratory infection, throat swabblings were culturally examined for haemolytic streptococci. If any child presented clinical features suggestive of such infection, he was given a single intramuscular injection of a preparation combining benzathine, procaine and crystalline penicillin.<sup>1</sup> Occasionally either procaine penicillin was given intramuscularly alone or penicillin by mouth. Whatever form of therapy was used, the aim was to maintain a concentration of more than 0.03 unit of penicillin per millilitre in the serum for a period of at least ten days. Patients and parents were urged to report all respiratory infections at once, either to their own physician or to the clinic.

Benzathine penicillin was used to "cover" dental surgery or tonsillectomy. The latter procedure was carried out on only two occasions.

<sup>1</sup> "Bicillin (Penidural) All-purpose" (Wyeth).

#### Control Series.

Each child was examined while in hospital, and the parents were interviewed. After discharge from hospital each child was examined at regular intervals and progress was recorded.

#### Results.

##### Recurrence.

**Group I.**—Data concerning patients observed after their first attack of rheumatic fever (Group I) are presented in Table II. The number of recurrences in the penicillin and control series is shown in relation to the period during which each recurrence took place. In contrast to the number of recurrences noted in the series receiving no prophylaxis, there were only two recurrences in the penicillin series. Although no study of sulphonamide prophylaxis was planned, the results are recorded and show a pronounced reduction in the recurrence rate. Figure 1 illustrates the contrast in recurrence rates observed under the three regimes. The cumulative percentage of first recurrence is plotted against time after the initial attack.

**Group II.**—Data concerning patients observed after their second attack of rheumatic fever (Group II) are presented in Table III. No recurrences were noted in the penicillin series in contrast to the number noted in the series receiving no prophylaxis.

**Group III.**—Of the five children who received penicillin after their third attack, none suffered a recurrence during the period of observation, but one developed chorea. Of 13 controls, two had a recurrence.

**Group IV.**—One boy, who first received penicillin after his fourth attack of rheumatic fever, had a recurrence. Neither of the controls was so affected.

#### Deaths.

Six children died during the period of study. All were in the control series, and in each instance death was due to cardiac failure of rheumatic origin. One death occurred during the first attack, four deaths after the second, and one death after the third.

#### Streptococcal Infection, Side-Effects and "Failures" in the Penicillin Series.

During the period of study three children had sore throats due to  $\beta$ -haemolytic streptococci (Lancefield Group A). One other child was a symptomless carrier. All four were given benzathine penicillin intramuscularly, and none developed rheumatic fever. It was not possible to study the incidence of streptococcal infections in the control series.

No child had a significant infection due to a penicillin-resistant organism while receiving prophylaxis. Yellow discoloration of the teeth was occasionally noted, but no other side-effects were observed.

Four of the 86 children failed to take penicillin continuously. One girl ceased prophylaxis ten months after her first attack, and had a recurrence a further ten months later. A boy discontinued penicillin prophylaxis nine months after his first attack and has had no recurrence. Another boy ceased penicillin prophylaxis eleven months after his second attack and suffered a recurrence sixteen months later. A girl discontinued prophylaxis four months after her third attack, and has remained well.

#### Discussion.

The evaluation of any scheme designed to prevent recurrence of rheumatic fever depends upon an understanding of the natural history of the disease. Roth *et al* (1937), studying a group of 488 rheumatic children, found that 68% had at least one recurrence during an average period of eight years' observation. The majority of recurrences were noted in the first three years after the initial attack. Stollerman (1954) reported similar findings. Approximately 50% of 239 rheumatic children suffered at least one recurrence over an average period of seven years. Again the majority of recurrences took place in the first three years.

TABLE II.  
Analysis of First Recurrences.

Period of Observation. (Months.)	Penicillin Series.		Control Series.			
	Observed After First Attack.	Recurrences.	Sulphadiazine Prophylaxis.		No Prophylaxis.	
			Observed After First Attack.	Recurrences.	Observed After First Attack.	Recurrences.
3 to 6	68	0	42	0	124	3
7 to 12	61	0	35	2	120	12
13 to 18	44	0	26	1	100	22
19 to 24	36	1	20	0	77	8
25 to 30	32	1	12	0	65	4
31 to 36	22	0	6	1	55	4
37 to 42	11	0	4	0	45	1
43 to 48	3	0	2	0	31	1
49 to 54	0	0	0	0	20	2
55 to 60	0	0	0	0	14	1
61 to 66	0	0	0	0	2	0

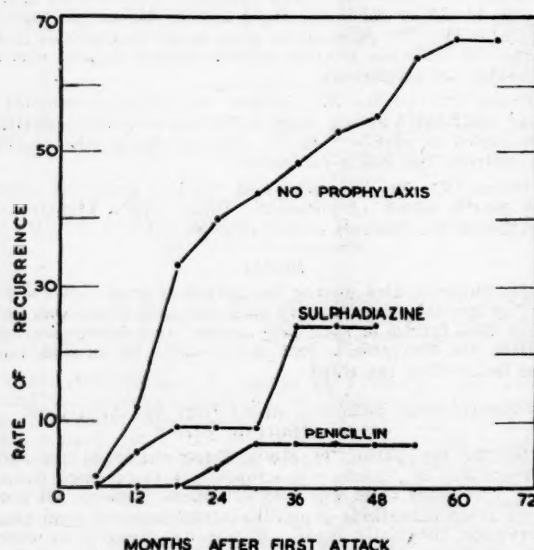


FIGURE I.

The cumulative percentage of first recurrence on the three regimes.

In the present study the children in Group I who received no prophylaxis show a high recurrence rate over five years, with a peak in the second year. Their histories represent the natural pattern of recurrence after an initial

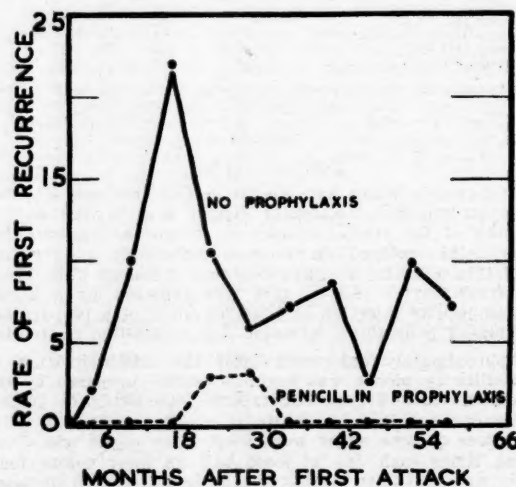


FIGURE II.

The rate of first recurrence per six-monthly interval.

attack of rheumatic fever. By comparison, there is a pronounced reduction in the number of recurrences in the penicillin series, which is shown graphically in Figure II.

Two children in the penicillin series developed an initial recurrence. Their histories, recorded below, are of some interest.

K. had his first attack of rheumatic fever at the age of six and a half years. Carditis and polyarthritis were present. Penicillin prophylaxis was commenced immediately and

TABLE III.  
Analysis of Second Recurrences.

Period of Observation. (Months.)	Penicillin Series.		Control Series.			
	Observed After Second Attack.	Recurrences.	Sulphadiazine Prophylaxis.		No Prophylaxis.	
			Observed After Second Attack.	Recurrences.	Observed After Second Attack.	Recurrences.
3 to 6	12	0	24	2	35	1
7 to 12	12	0	20	1	34	2
13 to 18	8	0	13	1	30	1
19 to 24	8	0	11	2	24	1
25 to 30	8	0	4	0	20	3
31 to 36	0	0	0	0	12	1
37 to 42	1	0	0	0	5	0
43 to 48	0	0	0	0	3	0



continued somewhat haphazardly for twenty-nine months. The boy was intelligent, but unwilling to take his tablets regularly. For two months the oral administration of penicillin was suspended, and monthly intramuscular injections of benzathine penicillin were substituted. (This was the only instance in the series in which parenteral prophylaxis was used.) After this, oral prophylaxis was recommenced and continued more regularly. Severe recurrence with cardiac failure and chorea then occurred after a respiratory infection. No hæmolytic streptococci were isolated from the boy's throat, but an antistreptolysin O titre of 330 units per millilitre of serum was recorded three weeks after the onset of symptoms.

M. suffered from rheumatic fever at the age of nine years, and carditis, polyarthritis and *erythema marginatum* were present. Penicillin prophylaxis was commenced at that time and was continued without interruption. Twenty months later he had a mild recurrence with polyarthritis and *erythema marginatum*. There was no evidence of carditis on this occasion. Previously he had had a sore throat, but no hæmolytic streptococci were isolated, nor, unfortunately, was it possible to estimate the antistreptolysin titre on this occasion. This boy and his family are intelligent and cooperative.

The known respiratory infections preceding recurrence in each of these instances were not reported early, and consequently were not adequately treated with penicillin for at least one week after their onset.

No recurrences were noted in Groups II and III of the penicillin series, but a boy in Group III had lone chorea ten months after commencing prophylaxis.

L. had rheumatic fever at the age of four years, and this was characterized by chorea and carditis. A similar recurrence was noted at the age of eight years. He received no prophylaxis after either of these attacks. At ten years a severe recurrence with carditis, nodules, polyarthritis and *erythema marginatum* occurred. Prophylaxis was then commenced and continued without interruption. Ten months later he presented with chorea not preceded by any known infection, and the antistreptolysin O titre was less than 50 units per millilitre of serum. This boy is one of a particularly intelligent and cooperative family.

Only one child received penicillin prophylaxis after his fourth attack, and he suffered a recurrence after ten months.

H. suffered from rheumatic fever at the age of six years, with carditis and polyarthritis, and six months later he had a similar recurrence. At seven and a half years he again suffered severe carditis and polyarthritis. He received no penicillin prophylaxis after any of these episodes. At the age of nine years he had a further recurrence with carditis and polyarthritis, and was then given penicillin prophylaxis, which continued haphazardly. Ten months later he had his fifth attack. No history of preceding infection was given, and carditis and polyarthritis were again present. The boy is emotionally unstable and the parents find it difficult to cooperate.

Little is known of the pattern of recurrence after the second and subsequent attacks of rheumatic fever, and the data available from Groups II, III and IV of this study are also insufficient to provide a clear picture of the natural history of the disease. However, in Group II penicillin seems to have provided some protection.

The occurrence of lone chorea in the history of L. raises an important point involving the relationship of chorea and rheumatic fever. Chorea may occur as a major manifestation of the disease, but it often presents during childhood in the absence of other rheumatic symptoms, when it is known as lone chorea. Poynton, Paterson and Spence (1921) referred to this relationship when they stated that "... because chorea occurs as a solitary symptom, we cannot exclude the likelihood of its being the solitary symptom of rheumatism". Jacobsson (1946) produced convincing evidence that children presenting with lone chorea, when observed for a sufficiently long period, eventually differed in no essential respect from other rheumatic children. The nature and degree of the ultimate cardiac disorder in each group of his series were the same.

Because other causes of chorea in childhood are rare, we believe that all children presenting with lone chorea should

be regarded as potentially rheumatic and should receive continuous prophylaxis.<sup>1</sup>

Complete protection was not achieved with the regime employed. Three rheumatic recurrences were recorded, and hæmolytic streptococci were recovered from four of the children in the penicillin series. This emphasizes the need for early recognition and adequate treatment of streptococcal infection even when continuous prophylaxis is practised. It may also indicate the need for a higher daily dose of penicillin than that used here.

Continuous prophylaxis also requires a high degree of cooperation from patients and parents, together with constant medical supervision, preferably by the same physician or at the same clinic. Those concerned should be fully informed of what is being done, of the risk of recurrence and of the need for continuity of prophylaxis over a long period.

If comparable protection can be achieved, the giving of penicillin twice a day offers obvious advantages over its administration three times a day. An interim report of the use of 200,000 units of buffered penicillin G given twice a day over a period of ten months has recently been published in America (Miller *et al.*, 1954-1955). In addition, the American Heart Association (1956) has suggested that this dose of penicillin given half an hour before meals may be adequate, but definite evidence is still lacking.

The ultimate hope of prophylaxis is the prevention of further cardiac damage in the rheumatic child. No attempt has yet been made in the present survey to assess this important point; but it may not be without significance that the six deaths occurred in the control series and that there was only one death during a first attack.

The overall result of this survey is encouraging. Although the average duration of penicillin administration is only twenty-two months, and the numbers so far studied are small, the recurrence rate has been significantly reduced. This would appear to justify continuance of the study.

In the light of all the available evidence, we believe that it is a grave error to withhold prophylaxis once a diagnosis of rheumatic fever or chorea has been made, and that prophylaxis should be continued throughout childhood and adolescence, and probably for longer.

#### Summary.

Penicillin G was given continuously by mouth to a group of 86 rheumatic children for an average period of twenty-two months. The dose used was 100,000 units three times a day. A control group of 166 children was also studied. None of these received penicillin by mouth, but some were given sulphadiazine.

Comparison of the two groups showed a significant reduction of the recurrence rate in the penicillin group. No side-effects were noted, and no infection due to penicillin-resistant organisms was encountered. It was not possible to assess the effect of prophylaxis on the cardiac lesion.

We believe that prophylaxis against streptococcal infection should be given to all children presenting with rheumatic fever or solitary chorea to prevent recurrence. Prophylaxis should be continued throughout childhood and adolescence, and probably for longer.

#### Acknowledgements.

We wish to thank Professor Lorimer Dods for constant help and encouragement, and the members of the honorary medical staff of the Royal Alexandra Hospital for Children, Sydney, for access to their patients. We are grateful to our social worker, Miss P. E. Grave, and should like to emphasize the important part she played in this study; the medical registrars to the Professorial Unit were also

<sup>1</sup>Seven such children have received penicillin continuously for an average period of twenty-five months. One had a recurrence of solitary chorea after twenty-seven months. These are not included in the foregoing results, since a single major manifestation excludes them under the diagnostic criteria already defined.

of great assistance. We also wish to thank Dr. H. O. Lancaster for help with statistics and diagrams. We are grateful to the Director-General of Health, Commonwealth Department of Health, for permission to publish this paper and for making penicillin available free of charge to the patients throughout this study. Lastly, we wish to thank Glaxo Laboratories (Australia), Proprietary, Limited, Wyeth International, Limited, Leo Pharmaceutical Products, and Drug Houses of Australia, Limited, for making available small supplies of their preparations.

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- 1937; Sangster, 1940; and Storey, 1948). The findings of these studies can be summarized under three headings—physical environment, financial status of the family, and emotional climate of the home. A review of this literature shows an absence of unanimity about dampness in and around the house, and about overcrowding. Sangster (1940) concluded that dampness and overcrowding appeared to be of ætiological importance; however, Storey (1948) found no significant difference in either the incidence or extent of dampness and overcrowding between the families with children with rheumatic fever and the control groups, and earlier Maddox (1937) had written as follows: "No definite relationship of known area of damp, either ground damp or poorly drained areas, could be established." Paul (1947) in a general review, without giving his references, concluded that dampness appeared to be a factor.

The financial status of the families was investigated by several workers (Medical Research Council, 1927; Sangster, 1940; Joos and Katsampes, 1952; Gray, Quinn and Quinn, 1952; Hewitt and Stewart, 1952). There seems to be general agreement that rheumatic fever occurs more frequently among the poor, but not necessarily in the poorest sections of the community.

Comparatively little attention has been paid to the emotional climate of the homes from which children with rheumatic fever come, although Hubble (1943) states that "there is no disorder in which the emotional and physical components seem more inextricably mingled". The study by the Medical Research Council (1927) paid some attention to the emotional aspects of family life. The data from Glasgow and from Saint Thomas's Hospital indicated that maternal care "was significantly less good in the rheumatic than in the control families", and in addition the Glasgow observers found a significantly higher proportion of parents with "alcoholic tendencies" in the rheumatic groups, although this is qualified by the remark that this is a point on which it is difficult to obtain reliable information.

In the absence of definite evidence from previous studies of the effects of social and emotional forces in the ætiology of rheumatic fever, it was decided to investigate these factors in a group of children. This study was made easier by the fact that some other members of the Institute were already making a study of the natural history of rheumatic fever in children, and the effects of oral penicillin prophylaxis (Dowd and Walsh, 1957). The present study was made on the same groups of children, during the two-year period from June, 1953, to June, 1955.

#### METHOD.

The children selected for this study were required to fulfil certain conditions: (a) to have a definite diagnosis of rheumatic fever according to the criteria as laid down by the Rheumatic Fever Council of the American Heart Association in conjunction with the Medical Research Council of Great Britain (1955); (b) to be living within a thirty-mile radius of the Royal Alexandra Hospital for Children, Camperdown; (c) to have had their first attack of rheumatic fever within the preceding twelve months (at the beginning of the study 26 children who had their first attack more than twelve months previously were included); (d) mothers of the children to have lived in Australia for at least five years and to be able to speak English fluently.

The children were drawn from two sources: (a) those who were under treatment at the Institute of Child Health and were receiving continuous prophylaxis, either with orally administered penicillin or with sulphadiazine; (b) those who were being treated elsewhere in the Royal Alexandra Hospital for Children, some of whom were not ordered prophylaxis on their discharge from hospital. Permission to study the environmental and emotional background of these children and the controls was obtained from the honorary medical staff of the Royal Alexandra Hospital for Children.

The mothers of all children admitted to the Royal Alexandra Hospital for Children with a provisional diagnosis of rheumatic fever or chorea were interviewed by one of the pædiatricians of the Institute of Child Health

#### SOCIAL AND ENVIRONMENTAL FACTORS IN THE ÆTIOLOGY OF RHEUMATIC FEVER.

By PHYLLIS E. GRAVE, Dlp.Soc.Stud., A.I.H.A.,  
Institute of Child Health, University of Sydney, Sydney.

A NUMBER of epidemiological studies designed to ascertain the importance of social and environmental conditions associated with the onset of rheumatic fever and chorea have been made in the United Kingdom (The Medical Research Council, 1927; Hewitt and Stewart, 1952), in the United States of America (Joos and Katsampes, 1952; Gray, Quinn and Quinn, 1952) and in Australia (Maddox,



engaged in these studies. If the child fulfilled the criteria outlined above, the mother was asked during the course of the interview whether she would be willing to participate in the sociological study by permitting a social worker to visit her at home. If she agreed, the necessary arrangements were then proceeded with. Only two mothers of the 122 children who were considered eligible for the study were not willing to cooperate.

In planning this study it was decided to investigate another group of children who would constitute the control group. The task of selecting the control group proved most difficult. Some of the previous studies, to which reference has already been made, have included a control group; but little detailed information could be ascertained about the exact nature of the group, and in particular about how they were selected. In this present study, although no attempt was made to match, by age or sex, each child with rheumatic fever with a child who did not have rheumatic fever, the children in the control group were limited to the same age range—three to twelve years—as the children with rheumatic fever. For the selection of controls, medical and surgical out-patient clinics were attended and suitable children were selected in collaboration with the physician or surgeon. After an introduction by the medical officer, a brief explanation of the nature of the study was given and the mother's cooperation sought. If this was offered, an appointment was made for a visit to the home.

Of the children attending the out-patient department of the Royal Alexandra Hospital for Children, a relatively low percentage were found to be suitable as controls, mainly because so many were suffering from chronic disease, or had symptoms strongly suggestive of a psychosomatic disturbance—for example, abdominal pain of non-organic origin (McKeith and O'Neill, 1951).

The nature of the illnesses suffered by the control group calls for some comment. Twenty-four children who were selected from a medical out-patient clinic were receiving treatment for such conditions as bronchiectasis, asthma, nephritis, persistent cough, easy bruising, colitis, gastroenteritis, congenital heart defect, vomiting and diarrhoea. Sixty children were selected from a surgical out-patient clinic, and their complaints included recurrent abdominal pain, undescended testicle, phimosis, prolapse of the bowel, lump in the breast, vaginal discharge, hernia, haemorrhoids, hypospadias, cyst behind the ear, melanoma, cervical adenitis and various orthopaedic conditions. The remaining 16 were siblings of younger children attending a surgical out-patient clinic.

A major difficulty experienced with the control group, which occurred only twice in the group with rheumatic fever, was the fact that although mothers agreed to cooperate when approached at the clinic, a significant number later withdrew. Of the 128 mothers who initially agreed to a visit, 28 later decided not to cooperate, leaving 100 in the study.

#### Comparability of Experimental and Control Groups.

No attempt was made to have an equal number of boys and girls in the experimental control group, but the controls were within the same age group. The distribution of the children in both groups according to age and sex is shown in Table I. Although the two groups are not strictly comparable as to numbers in each age and sex class, the two groups are sufficiently alike to justify comparisons of the data, as most of the factors which are compared are not influenced by age and sex within the age range of all children studied (that is, three to twelve years).

Of the children with rheumatic fever, 44% came from families with four or more children, compared with 27% of the controls, and about 2% of the children with rheumatic fever were only children, compared with 6% in the control group.

#### Schedule.

The information collected was recorded on a schedule, which was designed to contain certain environmental and sociological data and some of the interpersonal relationships within each family. The areas investigated were

grouped into five sections, as follows: (i) Physical environment: type of neighbourhood, type of home, crowding, dampness, sanitation. (ii) Economic situation: income two years prior to the child's illness, income at the present time, management of income, father's occupation. (iii) Setting of family life: education of mother, occupation of mother prior to marriage, cleanliness of home, quality of furnishings, appearance of mother, health of parents, social contacts of the family outside the home, recreational outlets of the family. (iv) Quality of family life: routine of the household, desire of the family for social advancement, separation of the child from the mother and the father, the period of separation, conjugal relationships, the mother's attitude to the child, quality and amount of affection shown by the mother for child, attitude of the father, adverse influence of grandparent or other adult occupant of the home. (v) The child in school: type of school, grade attained, number of schools attended, grades repeated, the child's attitude to school, to playmates and to teachers, the mother's attitude to school work.

TABLE I.  
Distribution of Children According to Age and Sex.

Age Group. (Years.)	Sex.	Rheumatic Fever Group.		Controls.	
		Number.	Percentage.	Number.	Percentage.
2 to 4	M.	10	8.3	14	14.0
5 to 7	M.	30	25.0	19	19.0
8 to 10	M.	11	9.1	21	21.0
11 to 12	M.	2	1.6	5	5.0
2 to 4	F.	11	9.1	3	3.0
5 to 7	F.	29	24.1	19	19.0
8 to 10	F.	20	16.6	13	13.0
11 to 12	F.	7	5.0	6	6.0

#### Ratings.

A point scale was arranged for each item. The scales ranged from two to 14 points according to the items studied. Thus income was assessed on a three point scale, as follows: 4.1 adequate, 4.2 marginal, 4.3 inadequate. For conjugal relations a five point scale was used: 28.1 good (compatible, no undue quarrelling); 28.2 fair (evidence of non-compatibility); 28.3 poor, but no open breach; 28.4 separated or divorced; 28.5 one spouse dead.

#### Collection of Data.

The schedule was built up from the material collected during visits to the child's home. The interviews with the mother were conducted according to social work technique and not in the form of a questionnaire, the mothers being encouraged to talk freely about the home situation with a minimum of direction, although naturally the interview was guided as far as possible along the lines most relevant for the purpose of the study.

The content of the interview varied considerably with each mother, depending on the aspect with which the mother was preoccupied. This in itself was useful in assessing the information given. Some mothers were difficult to interview and their responses were monosyllabic. In these circumstances there was no alternative but to ask a number of questions, care being taken, however, to avoid framing them in such a way as to receive an answer of just "yes" or "no". Other mothers were extremely verbose, and the difficulty was to keep them from digressing on to topics which were quite irrelevant.

The interviews with the majority of the mothers of the rheumatic fever group were easier to conduct than those with the mothers of the control group. The former were only too willing to discuss problems relating to housing, family relationships *et cetera*, since they thought this information might have a bearing on their child's illness. It was found necessary to stress the fact that, although the study was designed to find out more about the possible cause of rheumatic fever, it was not expected that any

individual mother could be told why her child had become ill. Several visits were paid to most homes to verify information collected at the first visit, and to collect more definite information on such subjects as conjugal relationships and mother-child relationships. The value of the repeat visits varied. In some interviews the additional information obtained was most useful in completing the schedule, while in others it was found difficult to have more than a superficial discussion of the current situation.

#### THE RESULTS.

##### Physical Environment.

Physical environment will be discussed under the headings of geographical distribution, housing and economic situation.

##### Geographical Distribution of Children with Rheumatic Fever.

When the homes in which the children were living were plotted on a map, fewer children with rheumatic fever than controls were found to have come from the more populated areas in the heart of the city—38% compared with 44% for the controls. No significance can be placed on this difference, since the Royal Prince Alfred Hospital is situated less than one mile from the Royal Alexandra Hospital for Children and provides a medical care service for a high percentage of children living in the congested industrial suburbs which surround both hospitals. It is interesting to note that a high percentage of the children with rheumatic fever came from outer, open, residential suburbs. This is contrary to the belief that the disease occurs mainly in congested slum areas. A study of the spot map, on which are plotted all children admitted to the Royal Alexandra Hospital for Children since 1951 with an accepted diagnosis of rheumatic fever, indicates that there is no particular area with an obvious concentration of rheumatic fever patients. Most of the children were living in localities along the main transport arteries passing near the hospital.

##### Housing.

A significantly higher percentage of families with children with rheumatic fever—15% compared with 4% in the control group—were found to be living in substandard types of dwellings—tenement, slum or tent. The majority of families in both groups—84% of families with children with rheumatic fever and 86% of the control group—lived in cottages of at least average standard as regards the actual structure. Of the controls, 10% lived in adequate flats.

More families with children with rheumatic fever were living in houses with definite overcrowding—31%, compared with 19% of the controls. A house was considered to be overcrowded if the sleeping space per person was less than 300 cubic feet. Of children with rheumatic fever, 26% were living in damp houses, compared with 13%; the criteria for dampness were obvious mildew on the walls, permanently leaking roofs, or house dampness due to a high-water table and a defective damp course. These differences are statistically significant, and are in line with the observations of Sangster (1940).

There was no significant difference in the two groups in relation to sewerage or drainage, either of surface water or of household waste. Of families with children with rheumatic fever 68%, and of controls 73%, lived in a sewered area.

Although there were differences in the two groups in respect of overcrowding and dampness, too much emphasis should not be placed on this finding, since less than one-third of the children with rheumatic fever were involved, and it is doubtful whether either factor is necessarily associated with the aetiology of rheumatic fever.

##### Economic Situation.

The distribution of children in both groups according to the actual income of the family and its management by the mother is given in Table II. Three categories of

income level and management were used in the survey, and a further subdivision of two categories is also shown in the table. Because of the arrangement of the data, a family will appear once in each category. It will be noted that there are more families with children with rheumatic fever in the marginal or inadequate income groups; the difference is statistically significant. Of the 67 families whose income was marginal or inadequate in the two years prior to the illness, 61 remained in this subgroup through the period of the child's illness; three had been in the adequate group prior to the illness, but moved into the inadequate group at about the same time as the onset of the illness.

TABLE II.

Actual Income and Its Management by Families of Both Groups.

Income.	Rheumatic Fever Group.	Controls.
A Adequate income 2 years prior to illness	53 (44%)	66 (66%)
B Marginal or inadequate income 2 years prior to illness	67 (56%)	34 (34%)
C Adequate income at present time	56 (47%)	69 (69%)
D Marginal or inadequate income at present	64 (53%)	31 (31%)
E Haphazard or unsatisfactory management of income	50 (42%)	13 (13%)

An important factor in the families with children with rheumatic fever is the high percentage of mothers who were rated poor managers. This is referred to later when maternal efficiency is being considered.

The higher percentage of families with children with rheumatic fever whose income was marginal or inadequate is also reflected in the occupations of the fathers, as shown in Table III. More breadwinners in the control group are in the type of employment which commands a slightly higher wage. It should be mentioned here that all the children studied in both groups came from families in a limited socio-economic class; in the main the fathers were unskilled labourers, artisans, and some white collar workers.<sup>1</sup>

TABLE III.

Occupation of Breadwinner.

Occupation.	Rheumatic Fever Group.	Control Group.
Skilled or semi-skilled tradesman	41 (34.1%)	55 (55.0%)
Unskilled labourers	30 (25.0%)	11 (11.0%)
Receiving social service benefits or pension	5 (4.1%)	—
Other occupations	38 (31.6%)	30 (30.0%)

##### Setting of Family Life.

##### Education of Mother.

The majority of mothers in both groups left school either before or at the end of second year in a secondary school—82% of mothers with children with rheumatic fever group, and 70% of mothers of children in the control group. This lower standard of education is reflected in the type of work done by the mothers prior to marriage; 55% of mothers with children with rheumatic fever and 31% of controls worked either as domestics or in a factory.

<sup>1</sup> The public hospital in-patients from whom these cases were drawn are limited to children whose net family income amounts to not more than £13 14s., which represents the present basic wage in New South Wales, after the following deductions have been made from the gross income: rent, £2 for the wife, £1 10s. for the first child, and £1 for each subsequent child. Eligibility to attend the out-patient department is based on a net family income of £15 or less after the cost of the rent has been deducted from the gross income.



### Maternal Efficiency.

Maternal efficiency is extremely difficult to assess objectively. Certain criteria of home care and the management of the family can guide an experienced investigator. The appearance of the furniture, the cleanliness of the house and the appearance of the mother were rated for each mother on a three point scale, and the points were totalled for each. The distribution of mothers according to the rating is shown in Table IV; the efficiency decreases with the numerical values. The figures in Table IV show a

TABLE IV.

The Distribution of Mothers in the Two Groups According to the Degree of Maternal Efficiency.

Points.	Families with Children with Rheumatic Fever.		Control Families.	
	Number.	Percentage.	Number.	Percentage.
9	33	37.5	44	44.0
8	28	32.3	30	30.0
7	18	15.0	15	15.0
6	15	12.5	6	6.0
5	14	11.6	4	4.0
4	6	5.0	0	0.0
3	5	4.1	1	1.0
	61	50.8	74	74.0
	33	27.5	21	21.0
	25	20.7	5	5.0

definite trend. More mothers with a low maternal efficiency were in the rheumatic fever group, although the correlation is not absolute.

It will be seen from Table V that there is a high correlation between maternal efficiency and the management of income. A much higher percentage of families (70) from the control group, compared with 44% in the families with children with rheumatic fever, were rated satisfactory in both areas.

TABLE V

Correlation of Management of Income and Maternal Efficiency.

Maternal Efficiency. (Points.)	Management of Income.					
	Good.		Haphazard.		Poor.	
	Rheumatic Fever Group.	Control Group.	Rheumatic Fever Group.	Control Group.	Rheumatic Fever Group.	Control Group.
9	44.0%	70.0%	6.5%	4.0%	—	—
8	10.8%	14.0%	15.6%	7.0%	0.8%	—
7	—	2.0%	17.3%	2.0%	3.2%	1.0%
6	—	—	—	—	—	—
5	—	—	—	—	—	—
4	—	—	—	—	—	—
3	—	—	—	—	—	—

### Parents' Health.

The mother's health was another factor which might have some bearing on a child's illness. However, in this study it was found that the majority of mothers were apparently in good health—61% of mothers with children with rheumatic fever, and 63% of mothers in the control group; only 7% and 6% respectively were judged to suffer from chronic ill-health. There was no correlation between maternal efficiency and maternal health.

A slightly lower percentage of fathers with children with rheumatic fever were classed as being in good health—64%, compared with 77% of fathers in the control group. The figures for those considered to be in poor health were the same as in the case of the mothers—7% and 6% respectively.

### Social Contacts of Family Outside the Home.

The majority of families in both groups neither initiated nor avoided social activities outside the home (apart from those maintained with their relatives). The figures for

families judged to be in this category were 66% of families with children with rheumatic fever and 57% of families in the control group. Of the remainder, 29% of families with children with rheumatic fever and 37% of families in the control group were considered to be mildly interested in activities outside the home; this included membership of their local parents and citizens' association, Boy Scouts Association, or some sporting group.

### Recreational Outlets of Family.

While there was no significant difference in the two groups in regard to sociability in its widest sense, in the control group a much higher proportion of families went out together regularly—47%, compared with 29% of families with children with rheumatic fever. It is worth recording that 17% of families with children with rheumatic fever were found to make infrequent family excursions to the beach *et cetera*, compared with 7% of families in the control group. Some sociologists use the extent of family outings as a measure of stability within the family and cooperation between parents. It is probably only a guide to family behaviour.

### Quality of Family Life.

The section relating to quality of family life deals with some of the factors in the home which could affect a child's emotional stability.

### Routine of the Household.

The norm for the heading "routine of the household" was classified as a partially planned household in which a regular routine was flexible. The majority of families in both groups came under this heading—71% of families with children with rheumatic fever, and 86% of families in the control group. Of families with children with rheumatic fever, 26% were classed as being haphazard in their routine, compared with 7% in the control group.

### Desire of Family for Social Advancement.

An intense desire to move up the social scale often accompanies obvious family pride and is revealed by parents' wishing to move to a better locality. Some clinicians hold the opinion that this type of family produces more than its quota of children with rheumatic fever; but in this present study only 11% of families with children with rheumatic fever were classed as having some desire for social mobility, compared with 12% in the control group. An obvious desire for social mobility was not noted in any of the families with children with rheumatic fever, and was noted in only 3% of the controls.

### Separation of Child from Parents.

The information collected under the heading of "separation of child from parents" did not produce any significantly different figures. The majority of children in both groups had separations of less than a month in duration. The main reason for the separation was the mother's admission to hospital for a confinement or for other causes. Only a few of the children studied were sent to an institution on these occasions; the majority either remained at home in the care of the father or another relative, or stayed in the home of a relative whom they already knew.

### Conjugal Relationships.

Of parents with children with rheumatic fever 73%, and 82% of parents in the control group, were classed as having good conjugal relations. Only 13% of parents with children with rheumatic fever and 8% of parents in the control group were found to have either a poor conjugal relationship or to be separated or divorced. These differences are not significant.

### The Quality of the Mother-Child Relationship.

An attempt was made to assess the mother-child relationship in broad terms—whether it was adequate or inadequate. Some mothers could not be placed in either of these categories, particularly those who were very excitable, and these have been put into a separate group.

A mother was considered to be adequate and well-balanced in her attitude if she appeared warm and loving, but consistently firm, able to put her child's needs before her own and, understanding those needs, took pleasure in the child's growth and development. The mothers in this category were also felt to be providing in reasonable amounts the five basic emotional needs of children (Shirley, 1948)—namely: affection, security, acceptance of the child as an individual, recognition of achievement, and the wise use of authority.

A mother was placed in the inadequate group if she appeared unduly submissive or permissive, if she was noticeably ambivalent (Fries, 1950) with much undue aggression against the child, or if she appeared unconcerned. Davis and Kent (1955) have defined the unconcerned parents as indifferent to their child's successes and failures, their interest in him being weak and negative; their disciplines tend to be inadequate, haphazard and inconsistent. The numbers of mothers in each category for the two groups are given in Table VI. The outstanding feature of these results is the high percentage of mothers of children with rheumatic fever who were judged to be inadequate, compared with the control group.

TABLE VI.  
*Classification of Mothers According to Quality of Mother-Child Relationship.*

Category.	Rheumatic Fever Group.	Control Group.
Adequate .. .. .	36 (30.0%)	56 (56.0%)
Inadequate .. .. .	74 (61.5%)	28 (28.0%)
Excitable .. .. .	9 (7.5%)	13 (13.0%)
Mother dead or unclassified .. .. .	1 (0.8%)	3 (3.0%)

#### *Attitude of Father.*

The majority of fathers in both groups—77% in the families with children with rheumatic fever and 80% in the control families—were classed as having a healthy, stimulating attitude to their children. Some fathers not only played with their children, but also liked to go out with the family as a group and to participate in their upbringing. Others were said by mothers to be fond of the children, but to take no active part in their management or recreation. A small percentage of fathers were classed as indifferent in their attitude. These included the fathers who rarely came home before the children were in bed, and preferred the company of their mates to that of their family.

#### *Influence of Grandparent or Other Adult in the Home.*

The influence of a grandparent or other adult in the home was pronounced in 2% of families in both groups, but was considered slightly adverse in 13% of families in the control group, as compared with 5% of families with children with rheumatic fever. In all other families there was no evidence to show that the children had been in any way affected adversely by the presence in the home of someone other than their parents. It should be stated, however, that the majority of mothers would not be aware of what constituted an adverse influence in the life of a child unless it was obvious and took the form of gross interference with the management of the mother, or a need to be continually repressing the child.

#### *Child in School.*

The various categories mentioned in the section of the schedule relating to the child in school were analysed, but failed to reveal significant differences between the two groups. The majority of children in both groups attended State schools, and the mothers were judged to be interested in their children's schooling. Only 7% of mothers with children with rheumatic fever were thought to be indifferent in their attitude, and 3% in the control group. It was found that very few children had an obvious dislike of school and of their teachers. With regard to the latter, it

was usually a particular teacher rather than teachers in general which evoked this response.

#### *The Occurrence of Multiple Factors.*

Dichotomy of the families of both groups according to whether they had been rated as satisfactory or unsatisfactory in six areas studied—namely, housing, crowding, dampness, income, maternal efficiency, and mother-child relationship—is shown in Table VII. The arrangement of the material in this table requires some explanation; for example, five families in the rheumatic fever group were rated unsatisfactory in the six areas, and 10 families were rated unsatisfactory in five of the six areas. Because of the combination of five different areas a "cross" has been used to indicate the area in which families were rated unsatisfactory. A blank indicates that the families were satisfactory in this area.

The observations in which families were rated unsatisfactory in five, four and three areas have been shown, whereas only totals have been given when two and one areas were rated unsatisfactory. The data were arranged in this manner in an attempt to determine whether any combination of areas occurred more frequently in families with children with rheumatic fever. In the families with five and four areas involved, it would appear that the three factors of income, maternal efficiency and mother-child relationship occurred as a constellation more frequently than any other three factors, but the dominance is not pronounced. The most striking feature is the high percentage of families with children with rheumatic fever which were rated unsatisfactory in four, five and six areas, and conversely the high percentage of families in the control group (namely, 73) rated unsatisfactory in one area only, or satisfactory in all areas, as compared with 43.5% for the families with children with rheumatic fever.

This analysis included both physical characters—for example, housing, crowding, dampness and income—and aspects of personality of some of the members of each family. A tentative conclusion which might be drawn from the data in Table VII is that the children who succumbed to rheumatic fever seemed to have a greater number of unfavourable factors in their physical and emotional environment than the children in the control families.

#### *DISCUSSION.*

An epidemiological study of this nature requires that a control group also be investigated. Attention has been drawn to the difficulties experienced in obtaining sufficient controls and to the less satisfactory nature of the interview with many of these mothers. When a child is suffering from rheumatic fever, or from a similar disease which is likely to leave permanent damage, most parents are only too anxious to discuss any aspect of the child's life which may help the treatment. Because of the absence of these emotional components, a mother who took her child to the out-patient department to arrange for a hernia operation or to obtain an opinion about a condition requiring operation did not reveal the same desire to cooperate in discussing aspects of the child's life as did the majority of the mothers of the children with rheumatic fever. This made the interviews with mothers of the control group more difficult, and made it awkward to plan subsequent visits. It was often found that these mothers withdrew from the conversation more frequently than the mothers of children with rheumatic fever when it appeared that the interview was beginning to move into the deeper layers of family life. For these reasons it is possible that the records for some of the controls are less complete. Other workers who have attempted this kind of investigation and who have included a control group have apparently met the same difficulties.

The presence of a chronically ill child in the household may well have been the determining factor which brought the families of children with rheumatic fever into this study, whereas such a force was missing from the controls. It is important also to point out that in selecting children for the control group, a deliberate attempt was made to reduce to the minimum the number of children whose



TABLE VII.  
Incidence of Multiple Factors.

Category: Number of Areas Involved.	Areas in Which a Family is Rated Unsatisfactory.						Number of Families Appearing in Each of the Specified Categories.	
	Housing.	Crowding.	Dampness.	Income.	Maternal Efficiency.	Mother-Child Relationship.	Families with Children with Rheumatic Fever.	Families in the Control Group.
6	x	x	x	x	x	x	5 (4.2%)	0
5	x	x	x	—	x	x	1	—
	x	x	x	x	x	x	3	—
	x	x	x	x	x	x	3	—
	x	x	x	x	—	x	3	2
	x	x	x	x	—	x	—	1
							10 (8.5%)	3 (3.0%)
4	x	x	—	x	x	—	1	—
	x	x	x	x	x	—	2	—
	x	x	x	x	—	—	1	—
	x	x	x	x	x	x	3	—
	x	x	x	x	x	—	5	1
	x	x	x	x	x	—	2	—
	x	x	x	x	x	x	2	3
							16 (13.3%)	4 (4.0%)
3	x	x	—	—	x	—	—	1
	x	x	x	x	—	—	1	—
	x	x	x	x	—	—	1	—
	x	x	x	—	x	x	3	—
	x	x	—	x	—	—	—	2
	x	x	—	x	x	—	—	2
	x	x	x	x	x	—	—	1
	x	x	x	x	x	—	1	—
	x	x	x	x	x	x	1	—
	x	x	x	x	x	x	8	2
							16 (13.3%)	8 (8.0%)
2	—	—	—	—	—	—	18 (15.0%)	12 (12.0%)
1	—	—	—	—	—	—	38 (31.6%)	31 (31.0%)
0	—	—	—	—	—	—	16 (13.3%)	42 (42.0%)
Total	..	..	..	..	..	..	119	100

presenting symptoms suggested emotional factors in the aetiology.

Some differences between the two groups are sufficiently pronounced, however, to be uninfluenced by differences in the nature of the interviews, the most notable being the assessment of maternal efficiency, which is based on objective data. To a lesser extent management of income would be in the same category, whereas assessment of the mother-child relationship might be more directly influenced by these differences in the quality of the interviews.

Contrary to previous studies, this investigation did not reveal any clear-cut dominant patterns. However, a number of trends have been demonstrated. The observation made by Maddox that rheumatic fever seemed to occur more frequently in families living in an area with a high-water table is not borne out in this study. This may be due to the fact that the majority of the children studied came from localities situated along the main transport arteries which pass the hospital, and these areas are not the low-lying parts of the metropolis. Although dampness in the house and defective surface drainage occurred more frequently in families with children with rheumatic fever, the differences were not pronounced. It is interesting that approximately four times as many families with children with rheumatic fever lived in substandard dwellings as compared with the controls; this difference is probably not significant, since these numbers are small; the majority of the families of both groups lived in houses or flats which were judged adequate.

A higher percentage of the families with children with rheumatic fever were judged to have marginal or inadequate incomes. This is in keeping with the observations made by other investigators. The actual income is not necessarily an indication of the real money available to meet the necessities of life. This and other studies have shown that the mother's capacity to manage income is

probably of greater significance within definite limitations than the actual money received. In some instances the father withholds a significant amount of his wages to be spent on drinking and gambling, leaving the mother an inadequate amount for household expenditure. Other mothers are poor managers and waste what would otherwise be an adequate income on frivolous or unessential expenditure, again leaving inadequate amounts to purchase the necessities of life. A high correlation was found between maternal efficiency and the management of income. Although management of income was not used to rate maternal efficiency, it would appear that this could well be one of the criteria used to measure maternal efficiency.

Probably the most striking fact which has been revealed by this study is the high percentage of mothers with children with rheumatic fever who scored low figures for maternal efficiency, compared with the control group. It is difficult to see the connexion between poor maternal efficiency and rheumatic fever in children, unless an insufficiency of funds to purchase the necessities of life creates anxieties and stress within the mother and child. This study was not planned to collect data on the presence of this type of emotional reaction in either adults or children in the family; but another investigation has been commenced in which an attempt is being made to elucidate this point.

In the last few years much emphasis has been placed on the quality of the mother-child relationship in both health and disease (Bowlby, 1951; Shirley, 1948; Davis and Kent, 1955; Fries, 1950). It has been shown (Clements, 1956) that when the mother-child relationship is poor, either because of long-continued separation between the child and mother, or because of inadequate support and security, anxieties and stress are likely to develop in the child. It has been further shown that these are revealed in behaviour disturbances and psychosomatic illnesses. The

possibility that an attack of rheumatic fever may be precipitated by undue emotional stress in the child is suggested by the figures in Table VI, which shows a high percentage of mothers judged to have poor relationship with their child compared with the control group. This study did not reveal the way in which an inadequate mother-child relationship might have affected the children with rheumatic fever, but this is being attempted in the current study.

Another interesting set of data is shown in Table VII. Attention is drawn to the fact that 85% of the control families either were rated satisfactory in all six areas, or were rated unsatisfactory in one or two areas only. This is in contrast to the figures for the families with children with rheumatic fever, since only 59% of them were in these categories. In other words, more than twice as many families with children with rheumatic fever were rated unsatisfactory in three or more areas. It is probably significant that 13% of these families, as opposed to 3% of the controls, were considered unsatisfactory in five or six of the areas studied. However, it must be borne in mind that the low percentage of the control families in these two categories may not be a true indication of the situation of the community at large, since it is likely that some mothers who were approached to participate as controls in this study, and declined, may well have been of this type.

As has already been suggested, it is difficult, if not impossible, without intensive longitudinal study of families, to interpret the significance of these findings in terms of the aetiology of rheumatic fever. The outstanding impression one is left with is the poor quality of family life in a significant number of families with children with rheumatic fever.

#### SUMMARY.

1. Certain aspects of the physical environment, the financial status of the family and the emotional climate of the home life of 120 children suffering from rheumatic fever were investigated. Similar inquiries were attempted for 100 children not suffering from rheumatic fever who were in the same age group and also came from the same socio-economic group; these children constituted the control group.

2. A number of factors occurred more frequently in the families with children with rheumatic fever, and for some of these the differences were statistically significant compared with the control group. The number of families involved were, for some of these conditions, too few to justify their being considered as directly associated with the aetiology of rheumatic fever.

3. Overcrowding occurred in 31% of families with children with rheumatic fever, compared with 19% of controls. Of children with rheumatic fever 26% were living in damp houses, compared with 13% of controls.

4. In 56% of the families with children with rheumatic fever income was judged to be marginal or inadequate, compared with 34% of the controls; in addition, 42% of the mothers of the former group compared with 13% of the controls were rated poor managers.

5. Of mothers of children with rheumatic fever, 21% were judged to have a low maternal efficiency, compared with 5% of mothers of the control group. Once again it is considered that the total number of families involved is too small to justify a claim that low maternal efficiency is of itself a factor in the aetiology of rheumatic fever.

6. Of families with children with rheumatic fever 66%, and 57% of families in the control group, were considered neither to initiate nor to avoid social activities outside the family. Of families in the control group 47% went out together regularly, compared with 29% of families with children with rheumatic fever.

7. Of mothers with children with rheumatic fever, 61.5% were judged to be inadequate in their relationship with their child who had rheumatic fever; this figure contrasted with 28% of the controls.

8. More than 50% of children in both groups came from the outer residential suburbs.

9. The observations in six areas—namely, housing, crowding, dampness, income, maternal efficiency, and mother-child relationship—were compounded for both groups. This analysis showed a high incidence of families with children with rheumatic fever to be inadequate in four, five and six areas compared with the controls, the three most commonly recurring factors being income, maternal efficiency and mother-child relationship.

10. Other areas investigated were the parents' health, the routine of the household, undue desire for social advancement, separations from the mother, conjugal relationships, the attitude of fathers, the influence of grandparents, and the child in school. In the main the effects of these influences upon the children of both groups were similar, being in the direction of assisting the child's growth and development.

11. In none of the areas investigated was the difference between the families with children with rheumatic fever and the control group sufficiently pronounced to justify a cause and effect relationship in the aetiology of rheumatic fever. However, the study did reveal the poor quality of family life in a significant number of families with children with rheumatic fever.

#### ACKNOWLEDGEMENTS.

My thanks are due to Professor Lorimer Dods for his continued help and encouragement. I wish to express to Dr. F. W. Clements my appreciation of his constant supervision throughout the study and of his help in the preparation of this report. My thanks are also due to the honorary medical staff of the Royal Alexandra Hospital for Children for allowing their patients to be used, and in particular to Dr. John Gibson and Dr. David Dey for their cooperation in helping to select children from their out-patient clinic. As this study was carried out parallel to that of Dr. B. Dowd and Dr. H. Walsh, it has been most helpful to have their cooperation in the selection of rheumatic fever patients.

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## Reviews.

**Textbook of Human Anatomy.** By J. D. Boyd, M.A., M.Sc., M.D., Sir Wilfred E. Le Gros Clark, M.A., M.D., D.Sc., LL.D., F.R.C.S., F.R.S., W. J. Hamilton, D.Sc., M.D., F.R.S. (Edinburgh), I. M. Yoffee, D.Sc., M.D., F.R.C.S., Sir Solly Zuckerman, C.B., M.D., D.Sc., F.R.S., and the late A. B. Appleton, M.A., M.D. Edited by W. J. Hamilton; 1956. London: Macmillan and Company, Limited; New York: St. Martin's Press. 10½" x 8", pp. 1034, with many illustrations. Price: £5.

A TEXT-BOOK of anatomy is usually considered a reasonably complete compendium to which a student can turn for the elucidation of at least most of his difficulties. In our experience, anyway, no student attempts to master the whole of the text-book—he treats it as a work of reference, and the majority of teachers take the same attitude. It is on that basis that most of the excellent text-books now available are designed. They can safely contain as much detail as space permits—since only what is wanted, or what the teacher advises, is used immediately—but nobody has yet shown that any anatomical detail is redundant. The appearance of a new text-book which claims to reduce the amount of factual knowledge presented to the student thus becomes a venture of considerable interest. We can sympathize with the editors in their complaint that "eliminating anatomical detail presents a serious difficulty". It is evident, too, that there was no unanimity over what detail should be eliminated, and this is reflected in the unevenness of treatment of the various sections. It is quite possible that yet other teachers might prefer to direct their own students on what to leave out rather than have that decided for them in this arbitrary fashion. On looking through the book from this viewpoint we find a good account of what might be called "average" anatomy, but any student seeking light upon any variation he encounters—and that applies to most students at some time—will get little help from this volume.

Another merit claimed for this work is that it aims to correlate structure and function. In principle, this aim is entitled to full admiration. In practice, however, the result is disappointing. While anatomy is reasonably well established and factual, physiology is still largely a collection of working hypotheses, liable to change at any time. Consequently, the "functional" section must either be limited and basic or risk being out of date. In the present instance the functional side is decidedly limited and basic—it is almost scrappy in parts—and the same applies to references to clinical applications.

The book is well produced, and very well and liberally illustrated by the old master, A. K. Maxwell, and by Frank Price. Some of the plates, on the other hand, are poorly reproduced. The authors are all distinguished men in their own fields of work which they interpret here according to their own lights, so it would be invidious—even if space permitted—to criticize their sections in detail. Since the writers also head important anatomy departments, a reasonable immediate demand is assured; but it will be interesting to see whether this book displaces established text-books in other schools. It will also be interesting to watch the progress of any future edition; in our experience anatomy books which start by eliminating detail tend to become progressively larger in succeeding editions as more and more of the despised detail is surreptitiously incorporated.

**Physiology of the Ocular and Cerebrospinal Fluids.** By Hugh Davson, D.Sc. (Lond.); 1956. London: J. and A. Churchill, Limited. 9½" x 7½", pp. 396, with 109 illustrations. Price: 65s.

THERE was clearly a need for this book, and there is probably no one better qualified for the task of writing it than Dr. Hugh Davson. Problems related to the ocular and cerebro-spinal fluids are given scant attention in physiological texts, and the results of experimental investigation are scattered widely in a literature which is predominantly clinical in nature. The basic problems of filtration, secretion and reabsorption are common to both fluids; but this is probably the first time that they have been treated as such in the same volume. The book is particularly to be welcomed because of the growing importance, from the pharmacological and therapeutic points of view, of the various filtration barriers that are interposed between the blood-stream and those fluids, the so-called blood-aqueous, blood-cerebro-spinal fluid and blood-brain barriers respectively. Dr. Davson describes the anatomy and physiology of these barriers and is only incidentally concerned with clinical matters. He is a general physiologist and while the account that he gives is on very broad physiological lines, the approach is essen-

tially an attempt to define the problems in physico-chemical terms. The book will be invaluable to the research worker in these fields and to the advanced student in physiology. However, it is designed to be read by the non-specialist and does not presuppose any great familiarity with the fundamental problems of cellular physiology such as permeability and osmosis. Indeed, the chapter on "Chemical Composition and Secretory Nature of the Fluids" is one of the best introductions at present available to the problem of the active transport of substances across cellular membranes. This is the central problem in modern general physiology. The book, particularly the early chapters, could be read with profit by the practising ophthalmologist and neurologist, and it is certain to have a wide usefulness to workers in many fields as a guide to the literature.

The general views expressed are those at present most widely accepted. Thus the aqueous humour is regarded as being formed by an active secretory process by the ciliary body. It is formed continually and drained away through Schlemm's canal into the venous system. The choroid plexuses are the main sources of the cerebro-spinal fluid, which drains into the dural sinuses. It is still not known whether the secretion is carried out by the endothelial cells of the capillaries or by the epithelial cells of the ciliary body and choroid plexuses respectively, and for this reason there is uncertainty regarding the site of the various filtration barriers. No very clear picture emerges of the relationship of the pial layer to the choroidal epithelium and the endothelial cells of choroidal capillaries. The possibility exists that the pial layer may contribute to the blood-cerebro-spinal fluid barrier. As far as the blood-brain relationship is concerned, Davson favours the view that the capillary endothelium is the site of the barrier. If this is the case, presumably the capillaries in the other regions could be the site of the barrier also. With regard to the primary physico-chemical mechanisms involved in the elaboration of the fluids, it is clear that the information at present available is grossly inadequate to permit of any certain deductions.

The book begins with two chapters devoted to the morphological aspects of the structures concerned with the fluids. Then follows a chapter on the chemical composition and secretory nature of the fluids. The main bulk of the book is concerned with the nature and sites of the blood-fluid barriers and the kinetics of exchange across them. A concluding chapter discusses the fluid pressures and the mechanics of flow.

The writing is a little diffuse and occasionally the problems are rather vaguely formulated, so that at times it is difficult to get a clear idea of just where the gaps in our knowledge lie. The large number of footnotes indicate that the book was probably written fairly rapidly, though this has the merit that it is up to date. This book will doubtless be regarded as the standard work in this field.

**The London Medical Handbook: 1956.** London: The British and Colonial Druggist, Limited. 10" x 8½", pp. 156. Price: 10s. 6d.

THIS annual publication is essentially a list of proprietary medicines, which sets out the maker or supplier, the composition and the therapeutic indications for each one. It also has short articles on "Artificial Materials in Surgery" by Professor Ian Aird, on "Modern Trends in Pathology" by R. D. Teare and N. F. C. Gowing, and on "Some Recent Pharmacological and Therapeutic Advances" by Professor A. D. Macdonald. The so-called therapeutic index at the end is of debatable value; but as a guide to proprietary preparations the book is most useful.

**Shaw's Textbook of Gynecology.** Revised by John Howkins, M.D., M.S., F.R.C.S., F.R.C.O.G.; Seventh Edition; 1956. London: J. and A. Churchill, Limited. 9" x 5½", pp. 712, with four plates in colour and 352 text figures. Price: 32s. 6d.

"SHAW'S TEXTBOOK OF GYNÆCOLOGY" in its seventh edition has been revised by John Howkins, but remains a standard work of the English school. The book is well produced and contains many new illustrations, a particular feature being the introduction of coloured plates.

In a book of this nature, some of the pages are occupied by unnecessarily elementary details, which might, however, be of value to students. The general practitioner or even the gynecological specialist can glean much information from new material in this edition. Chapters on tuberculosis and on carcinoma of the cervix are rewritten in full and conform to modern standards. Radiotherapy is adequately discussed in a separate section edited by I. G. Williams. In



another chapter, venereal diseases are dealt with in detail. The modern methods and trends of gynaecology are well exemplified by the section on colposcopic examination of the cervix and the cytological diagnosis of uterine cancer. Sterility is dealt with rather poorly, and this chapter is not very full, but it contains all the essentials for sound investigation and treatment and is eminently practical.

A pleasing feature of this text-book is the space devoted to operative technique immediately after the discussion of each lesion. The operative descriptions are necessarily somewhat scanty, but could later be expanded by the use of a text-book of operative gynaecology. Indeed, further reading is encouraged by adequate references appended to each chapter. One portion deals with contraception.

In brief, it may be stated in summary that this text-book has maintained the place it gained for itself among standard works on gynaecology.

**World Trends in Cardiology: Volume I, Cardiovascular Epidemiology.** Edited by Ancel Keys, Ph.D., and Paul D. White, M.D.; 1956. New York: Paul B. Hoeber, Incorporated. 8½" x 5½", pp. 203, with illustrations of tables and figures. Price: \$4.75.

**World Trends in Cardiology: Volume II, Cardiovascular Surgery.** Edited by Helen B. Taussig, M.D., and Arthur S. Cain, Junior, M.D.; 1956. New York: Paul B. Hoeber, Incorporated. 8½" x 5½", pp. 77. Price: \$2.00.

**World Trends in Cardiology: Volume III, Blood Volume and Contractile Protein in Heart Muscle.** Edited by Arthur S. Cain, Junior, M.D.; 1956. New York: Paul B. Hoeber, Incorporated. 8½" x 5½", pp. 141, with illustrations of tables and figures. Price: \$3.50.

**World Trends in Cardiology: Volume IV, Cardiovascular Diagnosis and Therapy.** Edited by Arthur S. Cain, Junior, M.D.; 1956. New York: Paul B. Hoeber, Incorporated. 8½" x 5½", pp. 107, with illustrations of tables and figures. Price: \$3.55.

**World Trends in Cardiology: Volume V, Instrumental Methods in Cardiac Diagnosis.** Edited by Louis N. Katz, M.D., and Arthur S. Cain, Junior, M.D.; 1956. New York: Paul B. Hoeber, Incorporated. 8½" x 5½", pp. 110, with illustrations of figures. Price: \$3.85.

THESE five volumes are made up of selected papers from the Second World Congress of Cardiology, and the Twenty-Seventh Annual Scientific Sessions of the American Heart Association. The titles indicate the ground covered. Many of the papers are headed by famous names, and a great deal of useful material is presented. As always with immediate reporting of a congress, the information is widely dispersed, but for cardiologists this is a valuable series of books.

**The Merck Manual of Diagnosis and Therapy.** Edited by Charles E. Lyght, M.D., William P. Boger, M.D., George A. Carden, M.D., Augustus Gibson, M.D., and Dickinson W. Richards, M.D.; Ninth Edition; 1956. Rahway, N.J.: Merck Company, Incorporated. 6½" x 4½", pp. 1886, with illustrations and tables. Price: \$6.75.

THE ninth edition of this manual is handsomely presented to the practitioner for easy reference. It is exhaustive, but not comprehensive. There is a great deal of useful information in this book, but one hopes that its use will be limited to refreshing the memory, and that it will not be used for didacticism.

**Alfred Hospital Clinical Reports: Volume VI;** 1956. Melbourne: published by Alfred Hospital. 10" x 6½", pp. 149, with illustrations and tables. Price:

VOLUME 6 of the "Alfred Hospital Clinical Reports" opens with an article by Dr. Murray Morton entitled "The Melbourne Medical School and the Alfred Hospital 1890-1896". This is the first part of his memoirs beginning from the time of his graduation, and it provides much interesting information about medicine in Melbourne in an earlier day. At the risk of seeming captious, we must point out that it is not correct to describe THE MEDICAL JOURNAL OF AUSTRALIA as "the mouthpiece of the B.M.A.", as Dr. Morton has done in his concluding paragraph. The rest of the volume is made up of 13 papers on medical and surgical subjects contributed by members of the staff of the Alfred Hospital. Major articles deal with splenectomy in disorders of the blood, atelectatic lesions of the middle lobe of the right lung, carcinoma of the stomach, the treatment of benign hypertension with reserpine and hydralazine, infectious hepatitis, the long-term effect of lumbar sympathectomy on the foot blood flow, paroxysmal paralytic myoglobinuria and Ebstein's disease.

## Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"The Treatment of Fractures", by Lorenz Böhler, M.D., translated from the thirteenth German edition by Otto Russe, M.D., and R. G. B. Bjornson, M.D., Volume II; 1957. New York and London: Grune and Stratton, Incorporated. 9½" x 6½", pp. 443, with many illustrations. Price: \$17.50.

This is the fifth edition in English.

"Positioning in Radiography", by K. C. Clark, M.B.E. F.S.R.; Seventh Edition; 1956. London: Ilford, Limited, William Heinemann (Medical Books), Limited. 11½" x 9", pp. 656, with 2150 illustrations. Price: 105s.

The first edition was published in 1939. In the present edition the book has been considerably revised and enlarged.

"Materia Medica and Pharmacology: For Nurses", by J. S. Peel, M.P.S.; 1957. Christchurch, New Zealand: N. M. Peryer, Limited. 8½" x 5½", pp. 184, with illustrations. Price: 24s.

Based on twenty years' experience of lecturing to nurses.

"Psychology, Religion, and Human Need: A Guide for Ministers, Doctors, Teachers and Social Workers", by W. L. Carrington, M.D.; 1957. London: The Epworth Press. 8½" x 5½", pp. 330. Price: 30s.

The author is an Australian psychiatrist with much experience in the field he discusses.

"Modern Office Gynecology", by George Blinick, M.D., F.A.C.S., and Sherwin A. Kaufman, M.D., F.A.C.S.; 1957. Philadelphia: Lea and Febiger, Angus and Robertson. 7½" x 5½", pp. 220, with 47 illustrations. Price: 49s. 6d.

Intended for everyday use by both the general practitioner and the gynaecologist "for on-the-spot diagnosis and therapy in office practice".

"Advice to the Expectant Mother: On the Care of Her Health and That of Her Child", by F. J. Browne, M.D., D.Sc., F.R.C.S.E., F.R.C.O.G., and J. C. McClure Browne, B.Sc., M.B., B.S., F.R.C.S.E., F.R.C.O.G.; Eleventh Edition; 1957. Edinburgh and London: E. and S. Livingstone, Limited. 7" x 4½", pp. 48, with illustrations. Price: 1s.

This book, which first appeared in 1926, has been thoroughly revised.

"Relaxation and Exercise for Natural Childbirth", by Helen Heardman; 1956. Edinburgh and London: E. and S. Livingstone, Limited. 7½" x 4½", pp. 32, with 22 illustrations. Price: 1s.

The author is a physiotherapist.

"First Aid: To Injured and Sick", by Halliday Sutherland, M.D., and I. Humphrey Evans, M.B., B.S.; Forty-Sixth Edition; 1957. Edinburgh and London: E. and S. Livingstone. 4½" x 2½", pp. 88, with 45 illustrations. Price: 1s. 6d.

Designed for use in emergencies and during revision for first-aid examinations.

"Clinical Toxicology: The Clinical Diagnosis and Treatment of Poisoning", by S. Locket, M.B., B.S., M.R.C.P. (London), with special sections by W. S. M. Grieve, M.Sc., Ph.D., F.R.I.C., and S. G. Harrison, B.Sc.; 1956. London: Henry Kimpton. 9½" x 6½", pp. 784, with 26 illustrations. Price: £5 5s.

Written by a physician in active clinical practice.

"Textbook of Pharmacology and Therapeutics: Including Materia Medica, Pharmacy and Dispensing", by Brenda Nath Ghosh, F.R.F.P.S. (Glasgow), F.R.S. (Edinburgh); 1956. Calcutta: Scientific Publishing Company. 9½" x 6½", pp. 672, with figures and graphs. Price: 35s.

The author is Professor of Pharmacology in the R. G. Kar Medical College, Calcutta.

"The Year Book of Drug Therapy (1956-1957 Year Book Series)", edited by Harry Beckman, M.D.; 1957. Chicago: The Year Book Publishers. 7½" x 5½", pp. 516, with 69 illustrations. Price: \$6.75.

One of the "Practical Medicine" series of Year Books.

## The Medical Journal of Australia

SATURDAY, MAY 4, 1957.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those adopted by the Quarterly Cumulative Index Medicus. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

### THE PROFESSOR'S FRIEND.

IN 1895 William Osler described pneumonia as the "enemy of the aged". Three years later, in the second edition of his "Principles and Practice of Medicine", he wrote: "Pneumonia may well be called the friend of the aged. Taken off by it in acute, short, not often painful illness, the old escape 'those cold gradations of decay' that make the last stage of all so distressing." Pneumonia is now so readily controlled by sulphonamides and antibiotics that it has ceased to be either an enemy or a friend to any beyond a favoured few. Its former role has been wholly assumed by coronary arteriosclerosis. Old people are no longer permitted the relative comfort of a speedy and painless departure with senses dulled, but are protected from the ultimate effects in the lung of gravity and myocardial enfeeblement by prophylactic administration of antibiotics. They must now choose another gateway to eternity, and continue to experience the weary burden of final enfeeblement. Rehabilitation after, for example, a cerebral thrombosis late in life is, at the best, a sad mixture of a clumsy gait and shattered brain. Osler accepted the view of Ecclesiasticus, when he said: "O death, kind is thy doom to a man broken in age."

In a stimulating lecture delivered at the University of Kansas in 1956, William Dock, of New York, himself a famous professor of medicine, refers to coronary disease as the "Professor's Friend". The title requires more qualification, as all professors are not elderly, and coronary disease is not the privilege of the academician. In fact, as Dock reminds us, it is now encroaching on the younger

decades of life, a fact which he partly ascribes to cigarette consumption. Other changes in the character of coronary disease since Osler's day involve its spread to all classes of the population, not merely the business executives, professional classes and others at privileged levels of society. Dock, referring to Americans, writes: "This change must be ascribed chiefly to the fact that since 1920 a very large part of the population has had a scale of living which in Osler's day was limited to 5 or 10 per cent."; and the disappearance of the commonly fatal infections has preserved many individuals to the point where coronary disease begins to manifest itself. However, the frequency with which coronary disease is recognized today is not due altogether to an actual rise in incidence, but also to the education of physicians to a recognition of its early clinical features, and to the universal availability of the portable electrocardiograph. That there has been an alarming and accelerating increase in coronary disease among the western peoples since 1900 is undeniable; it has been greatest in North America, and next in Australia. Dock reminds us that during World War II deaths from coronary disease in Americans under the age of thirty-five years appear to have been ten times as frequent as in the British forces, and more than one hundred times as frequent as in the Japanese services. Keys and others relate this extraordinary difference to the racial diet pattern, wherein a direct relationship can be observed between the incidence of coronary disease and the proportion of calories provided by animal fat. Where the latter become suddenly reduced, as a result of famine or wartime shortage, there is a prompt improvement in the mortality statistics of coronary disease. Obesity itself is not important; but conditions associated with a raised blood cholesterol level (and in particular where there is an increase in that part of the blood cholesterol bound to  $\beta$  globulin) consistently lead to early and extensive atherosclerosis. Within the racial and familial orbit, other factors such as age, sex, physical activity and tobacco play significant and influential roles. Dock himself offers persuasive argument that the ill effect of animal fat operates by increasing reabsorption of biliary cholesterol. All agree that vegetable fats and oils containing a predominance of unsaturated fatty acids lower the blood cholesterol level. Vegetarians would thus appear to have stumbled on the right road to prevention of coronary disease. However, only the vegetarians who also abstain from eggs or milk can expect such protection. Dock criticizes the resistance of many clinicians to the dietary cholesterol theory of atherogenesis, and compares them to the generation of physicians who could not bring themselves to accept the conclusions of Pasteur or Koch. He points to the universal distaste for a conclusion which should lead inevitably to a radical change in the dietary even of professors, and at the same time indicates a much less creditable aetiology than the oft quoted "wear and tear" of economic or academic success.

It is a severe mental wrench to accept eggs and milk, the classical articles of diet for the infant and the convalescent, as slow poisons, not to mention potential disaster to countries whose economy is based on primary produce. Be that as it may, mortality among good professors must be kept at a minimum; and their destruction or neutralization at the age of sixty, as suggested by

Osler in his final lecture at Johns Hopkins Hospital, would meet with little approval today, even from their potential successors. It would seem therefore that the professors' "best friend" is really Dr. Dock in his insistence on corn oil, in lieu of dairy products, as their staple diet from their day of election to the professorial chair.

#### ALCOHOLICS ANONYMOUS.

THE anonymity of Alcoholics Anonymous was deliberately broken recently at a meeting in the Sydney Town Hall. Thorough and extensive publicity brought along an audience so large that it overflowed onto the steps outside the hall where the speakers were heard through amplifiers. The meeting was straightforward and impressive. Most of the speakers were members of Alcoholics Anonymous ("retired alcoholics", as one put it), who described simply and with sincerity their individual experiences as helpless alcoholics who had achieved complete control of their condition through association with Alcoholics Anonymous. They represented a cross-section of the community, including a housewife, a priest, a doctor, a radio announcer, a tradesman and several business men. Other speakers were the wife of an alcoholic, and a clergyman and a well-known radio speaker; the two last-mentioned were not alcoholics, but had had much to do with Alcoholics Anonymous. The full names of the alcoholics were not given, so a degree of anonymity was preserved, but this planned action of coming out into the open was designed to make the movement known. It has been working in Australia for a good many years now, and it was felt that the results achieved were numerous enough and significant enough to warrant bringing the movement to general notice. The sole purpose in this was to ensure that those who might benefit from it, or who might wish to bring it to the notice of alcoholics, would know of its existence and aims. Most doctors know of Alcoholics Anonymous, and the subject does not need detailed discussion here. The only comment that needs to be made is that this effective movement of mutual help has little to offer the alcoholic who does not wish to be cured, but much to offer the one who does wish it. Its methods are simple and do not in any way cut across medical practice. It provides something that the ordinary medical approach to alcoholism cannot very well offer—the personal help of a group who have had the same problem and have coped with it. Groups of Alcoholics Anonymous meet regularly in many of the towns and city suburbs of Australia. The movement has an office in each of the principal cities; this is listed in the telephone directory under the title "Alcoholics Anonymous".

#### Current Comment.

##### PHOTOGRAPHY AND MEDICINE: SOME RECENT DEVELOPMENTS.

PHOTOGRAPHY in all its fields is full of surprises; there seems no limit to its potentialities, and it has practical as well as aesthetic applications in most spheres of human activity. Of these, medicine is probably the one whose

debt to photographic research is greatest. This being so, considerable interest attaches to four new developments which have been reported recently.

The first of these is photomacrography of the skin. C. E. Engel,<sup>1</sup> of the Department of Medical Illustration, Guy's Hospital Medical School, has evolved a method by which enlarged and comparable photographs of the skin may be produced. In designing the apparatus to be used, he started from the following premises: (i) The camera must be small enough to be held in the hand. (ii) Focusing cannot be visual, and must be automatic. (iii) Flash illumination is essential, to avoid recording movement of the camera or the subject. His instrument is based on a 2½ by 2½ inch roll film camera body, and from his description may be comparatively simply made. His paper is illustrated by three photomacrographs (x 6 magnification), showing the skin of a normal knee cap, Kyrle's disease on the thigh, and a healing abrasion on the dorsum of the right first finger, five days after injury. Engel points out that there are a number of variable factors to be considered in the process. These are: (i) the tension of the skin; (ii) the surface condition of the skin (whether fatty or dry); (iii) the direction of the lighting; (iv) positioning; (v) differences in different areas of the skin of the same body; (vi) differences in the same area of skin in different subjects; (vii) changes in appearance over a period of time. Non-photographic factors are (i) physical (atmospheric temperature, relative humidity, washing and other physical abrasion) and (ii) physiological (body temperature, and stimulation or inhibition due to hormones *et cetera*). Further research is required to exclude or standardize all these factors. Not until that is achieved will it be possible to study the natural history of a disease or the effect of treatment by the examination of serial photomacrographs.

Of interest to research workers is an article in the same journal by B. A. Jarratt,<sup>2</sup> in which he describes equipment for multiple frame flash photomicrography in living animals. The apparatus, which consists of a microcamera, flash tube unit, microscope substage optical system and stage, is described in detail. This work comes from the Medical Research Council Toxicology Research Unit, where Jarrett has been working with Dr. K. K. Cheng.

G. E. Donovan<sup>3</sup> discusses the use of colour in electron microscopy and radiography. In both processes it is desirable to take pictures at low and high kilovoltages, so that they will give complementary information; the low kilovoltage picture shows the soft detail, and the high kilovoltage picture the hard detail. By means of a device such as a chromoscope, these black and white pictures may be easily integrated into a colour picture. This shows the detail, not only of a single picture, but also of two or more pictures. When two or more orthodox black and white radiographs are superimposed, either mechanically or by optical projection, the detail of each radiograph tends to be obscured by the others. The new method produces variations not only in density, but also in colour; Donovan believes that the latter may be the more important. His description of the technical details, and of the advantages which the new process offers, is of great interest, but cannot be discussed here. His conclusions, which are as follows, are relevant. He points out that colour electron microscopy and colour radiography open up a new pathway; with this there will be no disagreement. At present no one can fix the boundaries of these methods, their ultimate developments and the uses to which they can be put. Colour will help to impress upon students the contrasting appearance of normal and diseased organs and tissues as seen on radiographs and electron micrographs. It should assist them to become and remain expert in reading the vague and shadowy forms of the usual black and white pictures. Even at this early stage of their development, the methods are of value in research, teaching and diagnosis.

The fourth paper is by John D. Trethowan,<sup>4</sup> and describes some experiments in endoscopic photography; it

<sup>1</sup> *J. Photograph. Sc.*, March-April, 1956.

<sup>2</sup> *J. Photograph. Sc.*, November-December, 1956.



comes from the Kent County Ophthalmic and Aural Hospital, Maidstone. Trethowan briefly reviews the literature concerning endoscopic photography and cinematography. He states that he himself is concerned only with still photography of the living human larynx by the indirect method. He devised the technique as a side issue, whilst he was attempting to write a paper about certain paralytic conditions of the larynx. It became apparent that the fleeting observations of individual workers, later drawn from memory or inadequately described, were insufficient for a serious study of the subject. Trethowan discusses the direct and indirect forms of laryngoscopic examination, and stresses the following points. First, considerable experience is needed to obtain consistently good views with the mirror. This is possibly one reason why photography by this method has lagged behind that in which the direct method is used. Furthermore, free movements of the head of the examining laryngologist and of the hand-held mirror are essential. Seldom can an adequate examination be made when the mirror is introduced at a fixed angle in relation to the viewing axis. In photography by the indirect method, the medical requirements are as follows: (i) The safety of the patient must be ensured, in a situation in which electrical apparatus is used and a metal instrument is placed against a mucous surface. (ii) The method should be applicable to all subjects whose larynx can be displayed by the normal clinical method. (iii) There should be a minimum of added discomfort for the patient, in comparison with routine clinical examination. There are two photographic requirements: (i) The laryngeal image must be found, centred, brought into focus and photographed along the same pathway. No deviation from the lens-to-object axis can be allowed for viewfinding. (ii) Owing to the funnel shape of the larynx, a number of structures are seen in the mirror at considerable variations of distance. As observation is usually by monocular vision, these distances are not easily appreciated. The maximum depth of field obtainable is therefore desirable. Trethowan has devised an apparatus which, as he puts it, offers a compromise solution of the various problems involved, five of which he lists, as follows: (i) Four light paths (viewfinding, photographic, viewing and exposing illumination) must finally share a common pathway between the camera and the larynx via the laryngeal mirror. (ii) Adequate illumination is required, first to see and then to photograph the larynx with a small lens aperture. (iii) Free manoeuvrability of the whole apparatus is needed, to leave both the operator's hands free to display the larynx. (iv) Unwanted reflections must be prevented. (v) The fogging of mirrors and lenses by the patient's breath has to be overcome. The details of the apparatus are given; it is fairly simple, and could be constructed from the description, which will not be reproduced here. Trethowan comments that it seems to give consistent results, in spite of anatomical variations such as the size of the mouth and the width of its opening. He has found it more satisfactory for repeated follow-up work on out-patients than for direct photography with an endoscope. He freely admits that it has been crudely made and is by no means the final answer. Some ingenuity is needed to solve the secondary problems; the clinician, who handles the laryngeal mirror and must himself operate the camera, should have the first say in design; the photographer should help him to adapt his apparatus. Trethowan confesses that, although the assembly is reasonably simple in use, he is acutely aware of Stanford's remarks about "complicated pieces of apparatus which only a fanatic can use". It is to be feared that this criticism can justifiably be levelled at some modern pieces of equipment.

#### ILLNESS AND DEATH OF MOZART.

The year 1956 was "Mozart's Year" in German-speaking countries and in musical circles the world over, for on January 27 the 200th anniversary of his birth was celebrated, whilst December 5 marked the 165th anniversary

of his death. Many glowing tributes were paid to the immortal beauty of his music, and sorrow was expressed that the last years of his brief life (he died aged under thirty-five years) should have been clouded with poverty, neglect and illness. At least two attempts have been made to examine the assured facts of his bodily infirmities with respect to medical diagnosis. One, "*Les douloureuses rencontres de Mozart de la médecine et des médecins*", appeared in *La Presse médicale* of December 25, 1956. This well-illustrated article is especially useful in presenting the main events of his youth from a medical standpoint. We all know the story of this child prodigy and the wonder he aroused; but it is not generally recognized how callously his father dragged the unfortunate boy from city to city and from concert to concert, often travelling in winter over long stages, through bad roads and in unheated coaches, robbing the child of sleep and always anxious to stick closely to a crowded programme. Was it greed or was it sheer blindness to his son's physiological needs? Both the boy's parents and his only sister lived to a ripe old age, and possibly the good health of the father made him regard his son's illnesses as "bagatelles"—his own word. Shortly after his arrival in Vienna, the six-year-old boy developed fever with pains in the joints and pharyngeal catarrh. His father described the condition as manifesting pain in joints, hip and pelvis, with eruptions tender to the touch, the size of a kreutzer, on legs and elbow. No doctor was called in, and Mozart, senior, administered certain powders; later he gave some particulars verbally to a doctor, L. H. Bernhardt, who went to see the boy and offered a casual diagnosis of "a sort of scarlatina". Mozart, senior, complained that the illness had cost him four weeks of concert giving, and estimated the loss in ducats. From this time on the boy suffered from attacks of rhino-pharyngeal catarrh with arthritis. In 1763 he contracted smallpox, fortunately of a mild type; this produced the usual pock marks on his face, common in his day, of which he was always a little self-conscious. It may be mentioned here that he was born with a malformation of one pinna, which he hid by wearing his hair long. When he reached his twenties his frame was slight, and a prominent feature was a rather large nose. A pale complexion was noted as early as 1771. In 1784 he had definite renal colic with fever and pyuria. It is well to remember this date, for kidney disease was undoubtedly the cause of death, which took place in 1791. One doctor refused to have the youth as a patient; it has been suggested that he was doubtful about obtaining his fee. However, in 1789 Dr. Closset attended the young man, and remained his faithful medical adviser to the end. In 1791, the year of Mozart's death, his creative powers in music were at their highest level, but illness again overtook him; he was affected by oedema, exhaustion, vertigo and a rapid loss of weight. Despite these difficulties, he worked hard at composing, especially at his famous "Requiem". On November 18 he directed in public a new cantata; two days after this oedema and weakness increased, but he still laboured at his "Requiem", though in bed. Only two hours before his death, on the night of December 4-5, did he lose consciousness. That he felt the end approaching some weeks before the actuality is mentioned by his biographer, Nissen. His "Requiem" was his own, he declared. When his wife tried to cheer him, he replied with tears in his eyes: "No, no, I feel it too deeply. It will not last long with me. I have been given poison. I cannot get rid of that idea." The four doctors responsible for the death certificate made no final decision as to diagnosis; there was no post-mortem examination. The day after his death his body was taken from his home, and on the following day was thrown into a trench with fourteen other corpses and quickly buried—a pauper's grave, in fact, which, as usual, was not marked. The three friends, who might easily have spared a few gulden to pay for a private grave instead of leaving it to the parish to meet the small expense of the interment, did not wait to see the end; it began to rain, and so they went home.

That Mozart's belief in the administration of a poison was no fantasy has been seriously considered from time to time, and suspicion has fallen on Antonio Salleri, the

composer and theatre director, who made no secret of his hatred of Mozart, a hatred based on jealousy. The Russian historian of music, Igor Belsa, wrote that Salleri, on his death bed in 1825, confessed to the murder of Mozart by poison. It is doubtful whether any weight can be attached to this statement. In the *Wiener medizinische Wochenschrift* of December 22, 1956, there is an article by Dr. D. Kerner on the death of Mozart from which many of the facts given above have been taken. Dr. Kerner accepts the poison story, and points out that the signs and symptoms are startlingly like those following mercury poisoning. He offers no suggestion as to how and in what form the mercury was administered, or why the victim did not take any measures to protect himself or denounce the culprit; nor does he mention that the kidney trouble, which he ascribes to mercury, had already begun, as stated, in 1784. The editor of the *Wiener medizinische Wochenschrift* in a footnote remarks that, whilst the article is interesting, he cannot accept Dr. Kerner's views in their entirety. That will be the attitude of most medical readers.

#### NEW DRUGS AND NEW DANGERS.

"EVERY procedure which the doctor employs conceals within itself some danger for the patient." This aphorism is the opening sentence of an address given by A. Wiedmann to the Society of Physicians in Vienna on October 28, 1956. The address is published in the *Wiener klinische Wochenschrift* of December 14, 1956, with the title (translated) "On Some Side Actions of Drugs Used in Skin Therapy". Wiedmann writes as a clinician and displays an admirable candour. If he has not himself encountered a certain condition, he says so. For example, he states that chlorpromazine can occasionally bring about distressing allergic reactions, and curiously more in doctors and nurses than in patients; but this occurrence he has not seen in his own *Klinik*, though it is common in the psychiatry wards—possibly, he quietly remarks, because more care is taken in his department. He advocates gloves and face mask if such allergy is detected. The labours of chemists, pharmacologists, bacteriologists and biologists are constantly introducing new and more powerful medicaments, but these, he warns us, are beset with greater dangers. He instances some antibiotic ointments which are not really therapeutically better than the old preparations which had no side effects. Reading between the lines, one gathers that Wiedmann is highly critical of the advertisements which swamp every doctor's desk at mail time, with statements that the new hypnotics are free from danger and do not beget habituation, and so on. Urethane is loudly proclaimed as safe, but he has had cases in which its administration was followed by anorexia, nausea and burning pain in the gastric region; he always gives urethane dissolved in milk and advises that it should never be taken on an empty stomach. Antibiotics come in for some shrewd comments. One unexplained phenomenon is that allergic manifestations may subside under antihistamine treatment, but continuance of the medication may bring back the allergic condition in a more intense form and often in another site. Antihistamines can sometimes sensitize the patient's body, though this, as Wiedmann states, is a "*contradictio in adjecto*", and render it allergic to a whole group of substances allied chemically to the antihistamine drug. One remarkable fact is mentioned—namely, that in the United States of America there is a far higher incidence of allergic troubles than elsewhere. Dr. Wiedmann is inclined to attribute this in part to the higher tension in American life, in which there is little relaxation; it is well known that a psychic factor is often present in asthma, hay fever and kindred conditions. Also, Americans eat more stored food, and this, too, may be operative. The depressant action of penicillin on the gonococcus has led to a curious use—namely, that licensed women of the street know they can face the routine examination with composure if they have swallowed some penicillin the day before. Sulphonamides often produce a "drug fever"

(the English phrase is used) a week after the end of administration. Wiedmann admits that he could easily extend the list; he has, for instance, observed considerable damage following careless use of cortisone. It would be of benefit if this article were translated into English and made available to a larger circle of medical readers.

#### CHAMOIS LEATHER AS A PROSTHETIC MATERIAL.

THE technical ingenuity of surgeons is immense; and in this respect vascular surgeons are no exception. They have made vascular prostheses from substances as varied as ivory and stainless steel. C. F. Kittle and C. Taquechel<sup>1</sup> have turned their attention to the use of leather as a prosthetic material in vascular surgery. Leather has the *prima-facie* advantages of being an inert animal material which is pliable, durable, cheap and available. The leathers used by Kittle and Taquechel were chamois, skiver and lambskin; these were obtained from a commercial leather shop. They were all washed with soap and water and then sterilized by immersion in a 1:1000 benzylalkonium chloride solution for twenty-four hours. Leather grafts were introduced into 36 mongrel dogs; 25 grafts were of chamois leather, seven of skiver skin and four of lambskin. The results with skiver and lambskin were hæmorrhage and empyema, since these materials were difficult to work with and suturing was difficult.

Chamois leather grafts were made in three groups. The first group consisted of right ventricular patches. Windows measuring 2.0 by 2.5 centimetres were cut in the right ventricular wall, and these windows were covered with chamois leather, which was easily sutured into place. Of six dogs, none showed any post-operative morbidity. Five dogs were killed for information, but one was living and well one hundred and sixty-one days after operation. The second group consisted of six dogs who received chamois leather windows measuring 1.0 by 2.0 centimetres in the thoracic aorta. None showed any post-operative morbidity, but one dog died one month later of distemper. None of the remaining five exhibited any abnormalities, and one has been allowed to live one hundred and fifty-two days after operation, being perfectly well the whole time. The third group consisted of 12 animals who received thoracic grafts of chamois tubes of 0.5 to 1.0 centimetre diameter by 2.0 to 10.0 centimetres length. Of these dogs two died eight days post-operatively of a leaking anastomosis. Aortography killed two more dogs. Five dogs are alive and well sixty-eight to one hundred and fifty-one days after operation.

The pathological appearances were of great interest. The tissue reaction was little and of the same order as with polyvinyl sponge. The inner surface of the grafts was covered with a glistening and fibrous layer on which endothelium was growing. As the chamois is porous, blood soaks the graft and clots. This provides a channel, and fibrous tissue invades the graft using it as a scaffolding. This offers hope of a satisfactory repair by the host tissue. These results are of great promise, and it is to be hoped that the matter will be investigated further.

#### LEUCHÆMIA ETHNOLOGY.

THE incidence of leuchæmia has increased enormously within the last twenty years, and recent papers have pointed to the relation between leuchæmia and radiation hazards. It has also been noted, particularly in America, that there seems to be a difference in the incidence of leuchæmia in people with differing ancestries. In a recent paper, B. MacMahon and E. K. Koller<sup>2</sup> have investigated this clinical impression, and also the well-authenticated difference in incidence of leuchæmia as a cause of death

<sup>1</sup> *Arch. Surg.*, January, 1957.

<sup>2</sup> *Blood*, January, 1957.

on death certificates between the white and coloured populations in America. The survey which MacMahon and Koller have carried out is a careful one which takes note of a great number of possible and important misleading factors.

The authors have analysed the death certificates in Brooklyn in the years 1943-1952. Comparison of standardized death rates in native-born and foreign-born whites shows that foreign-born whites have a leucæmia death rate of 61.0 per million, whilst native-born whites have a rate of 45.3 per million. When these rates are broken down into country of origin, it is found that Russian-born people have a death rate from leucæmia 1.9 times as high as other foreign-born people. This figure, if true for all age groups (unfortunately this could not be ascertained), would be enough to account for almost all the difference between native-born and foreign-born white people. As practically all the Russian-born population of Brooklyn is Jewish, MacMahon and Koller decided to investigate the incidence of leucæmia in Jewish and non-Jewish people. As a survey had shown that cemetery of burial was a satisfactory indicator of religion, this item upon Brooklyn death certificates was used as a source of information. This information produced the following ratios for death rates from leucæmia in Jews and non-Jews, on a basis of standardized death rates: native-born males 2.5:1, native-born females 2.2:1, foreign-born males 2.4:1, foreign-born females 2.0:1.

MacMahon and Koller are careful to point out that many factors are unknown, such as occupation, recreation, nutrition, social welfare, and incidence of medical attendance. However, if the difference is borne out elsewhere, it will provide evidence of another disease in which Hebrew people have a different incidence compared with other races.

#### HÆMOLYTIC ANÆMIA.

THE word idiopathic is one which connotes: "I do not know." Within recent years some cases of idiopathic or acquired hæmolytic anæmia have become known as autoimmune hæmolytic anæmia. This is taken to mean that the body has produced antibodies against its own erythrocytes. Although more insight into this disease has undoubtedly been obtained, we are still no wiser about why the body produces these antibodies. W. H. Crosby and H. Rappaport<sup>1</sup> are of the opinion that, while this condition is not rare, it is not common enough for a simple observer or even a clinic to amass a significant degree of experience. The authors therefore studied the files of the Armed Forces Institute of Pathology and collected 57 cases of autoimmune hæmolytic anæmia. The 57 cases were subdivided into idiopathic (34) and symptomatic (23) groups. The symptomatic group was further subdivided into a malignant group (16) and a miscellaneous group (7). When the age structure of the patients in these groups is examined, it is seen that the incidence of symptomatic autoimmune hæmolytic anæmia rises with increasing age, and it would seem that this association is an important one to remember when we are dealing with hæmolytic anæmia in patients over the age of forty years, as malignancy may be patent. In all groups crises were over twice as common in the six months from November to April (that is, the American winter), and crises seldom occurred during the three months from May to July. This same phenomenon of distribution can be noted in the 18 deaths amongst patients with idiopathic autoimmune hæmolytic anæmia.

Crosby and Rappaport also record details of several patients who at first had been diagnosed as suffering from idiopathic autoimmune hæmolytic anæmia, but who subsequently developed conditions such as malignant lymphoma and disseminated *lupus erythematosus*.

The results of treatment in this series are not very illuminating. Of 27 patients who underwent splenectomy

11 are dead. Present-day opinions on the treatment of autoimmune hæmolytic anæmia are probably very fluid anyway. Many clinicians who are acquainted with this disease have watched patients slip away from their care and die, because compatible blood could not be found. Cortisone has proved no panacea, and most patients have ultimately relapsed, and then had their spleens removed. How often has a patient after a long period of treatment, involving Herculean effort, left hospital feeling "better now than I've been for years", only to return in a few weeks a shadow of his former self!

One of the most interesting features of this disease is the relation between it and diseases such as *lupus erythematosus* or other collagen disease which may develop, or another cryptic disease, porphyria. With this in mind, the sometimes remarkable response to cortisone, for a time, of some patients with autoimmune hæmolytic anæmia is perhaps significant.

#### PROCTOSIGMOIDOSCOPY.

WE are all well acquainted with the procedure of sigmoidoscopy and have some idea of the sights which may be seen upon looking up a sigmoidoscope. One of these is a polypus of rectum or colon. Benign mucosal polypi are true tumours, and are regarded as having a low potential for becoming malignant, although carcinomata do develop in them. This matter has received the attention of the Cancer Prevention Centre of Chicago. Patients are not treated at this centre, it is merely a service to the public for detecting early cancer. Patients seen there must not be under any form of therapy from their physicians at the time, because the examination is performed on presumably healthy asymptomatic persons. Proctosigmoidoscopy is a routine procedure. In twelve years 50,000 such examinations have been carried out. This procedure has revealed 3624 benign polypi, 328 malignant polypi (7.9% of the total polypus incidence), 347 rectal carcinomata including carcinoma-in-polypus, and one sigmoidoscopic tear of the colon.

C. Portes and J. D. Majarakis<sup>1</sup> regard these figures as adequate evidence for subjecting all adults over the age of forty-five years to routine and periodic sigmoidoscopy. This is all very well, but we may well wonder how the patient feels after his examination; and whether nothing but good comes from diagnostic centres. No one would dispute the benefits of public education, but mass examination is rather different.

#### THE ANTERIOR TIBIAL SYNDROME.

THE anterior tibial syndrome is an unusual condition occurring in the anterior tibial compartment, involving ischæmia and usually necrosis of muscle. The ætiological basis is generally a sudden arterial occlusion or violent over-activity, particularly in a person to whom exertion is a little strange. The history is one of sudden pain down the anterior part of the leg. Erythema, swelling and great tenderness are present over the anterior tibial muscles within a few hours. Foot drop usually occurs quickly. The peripheral pulses are present. The clinical progress of the condition may be of any grade from abscess formation and bone damage to slow resolution with fibrosis. The latter course is probably the more common, resolution taking the usual course of fibrosis. The condition is now becoming more widely known, and L. Blum<sup>2</sup> has recently described four more cases. It is worthy of mention because early treatment is essential if fibrosis is to be avoided. Treatment, which is simple and effective, consists of incision of the overlying fascia.

<sup>1</sup> J.A.M.A., February 9, 1957.

<sup>2</sup> Arch. Surg., January, 1957.

<sup>1</sup> Blood, January, 1957.



## Abstracts from Medical Literature.

### **PATHOLOGY.**

#### **Renal Tubular Necrosis After Burning.**

S. SEVITT (*J. Clin. Path.*, November, 1956) has analysed the renal lesions found in 86 subjects who died after severe burning. The characteristic lesions were necrosis of renal tubules. In children and young adults the lesions were mainly in the distal portion of the nephron, while in the elderly the lesions were in the proximal part. Between these two age groups there was a gradation. Distal tubular necrosis was often associated with renal failure. When many nephrons were involved, it was associated with anuria or severe oliguria, though some patients were in a state of acute uraemia while passing normal amounts of urine. In patients with distal tubular necrosis, haemoglobinuria was usual, and the haemoglobin casts were thought to be etiologically significant in producing the epithelial necrosis. When the lesions were only focal, they were infrequently associated with renal failure. Proximal tubular necrosis was thought to be etiologically determined by the presence of nephrosclerosis. It was commonly associated with severe oliguria, and in some there were glomerular thromboses. Of elderly persons surviving ten days or longer, none developed oliguria, and the necrosis found at autopsy in these may have been related to infective complications rather than to the burning.

#### **Strawberry Nævus of Infancy.**

T. S. WALSH AND V. N. TOMPKINS (*Cancer*, September-October, 1956) have published their observations on 192 infants suffering from angiomatous neoplasms of infancy. They point out that these lesions are usually supplied by a single artery; they are benign and tend to undergo spontaneous regression. However, in certain areas, because of interference with growth, treatment may be necessary. These are the head, neck, shoulders, genitalia, thenar eminence and ankles. Lesions in other sites may be ignored. The object of treatment is to initiate the regressive phase. This may be obtained with the application of carbon dioxide snow or dry ice for brief periods; or, if this is insufficient, the nutrient artery may be occluded by injection or ligation. Extirpative surgery is regarded as unnecessary and harmful in all but small or inconspicuously located growths, for it is often followed by serious loss of function.

#### **Morton's Metatarsalgia.**

T. M. SCOTT (*Arch. Path.*, January, 1957) describes the underlying lesion of the syndrome of Morton's metatarsalgia. He states that the syndrome occurs more frequently in women and is characterized by neuralgic pain in the foot, usually beneath the heads of the third and fourth metatarsals. The initiating cause of the disease is thought to be trauma from weight bearing and from the use of small,

high-heeled or other ill-fitting shoes. The lesion of the plantar digital nerve is commonly referred to as a neuroma. It is actually a fibrosis of the oedematous nerve with disappearance of some fibres. The fourth nerve is usually involved. This nerve, which has a double derivation, is less mobile than the other digital nerves and is more readily damaged by dorsiflexion of the foot. Injury may also occur in the plantar digital artery at the same time. Conservative treatment is usually successful, but in some cases it is necessary to excise the affected nerve.

#### **Giant-Cell Tumour of Bone.**

J. J. MORTON (*Cancer*, September-October, 1956) reviews the subject of giant-cell tumour of bone. He states that while there is no unanimity about treatment, there is a unanimous opinion that all diagnoses should be confirmed by biopsy, that 15% to 30% of cases recur after irradiation or surgery, and that malignant change occasionally supervenes. In one of the cases reported, repeated curettages and irradiation are blamed for the subsequent malignant change. The conclusion reached in this paper is that giant-cell tumours of bone are imperfectly understood and should be studied further.

#### **Cirrhosis and Malnutrition.**

J. HIGGINSON, B. G. GROBBELAAR AND A. R. P. WALKER (*Am. J. Path.*, January-February, 1957) have studied the role of nutrition in the development of cirrhosis in the Bantu. Their material consisted of 876 consecutive necropsies and 215 liver biopsies. The hepatic lesions were of three main types: (a) fatty liver occurring in infancy, the result mainly of kwashiorkor, and rarely followed by fibrosis and necrosis; (b) fine symptomless fibrosis, most frequent in the second half of life and usually associated with heavy hemosiderin deposits; (c) severe cirrhosis, most frequently of post-necrotic origin and showing no specific age trend. More than half the livers in the third group had developed primary carcinoma. The authors conclude that the malnutrition of early childhood causes an irreversible abnormality of liver metabolism without any accompanying architectural disturbance; and that this renders the liver susceptible to noxious factors such as siderosis, hepatotoxic viruses and possibly toxic drugs.

#### **Chronic Alcoholism.**

K. T. NEUBERGER (*Arch. Path.*, January, 1957) describes the changing pattern in the neuropathological picture found in chronic alcoholism. The classical appearances of Wernicke's disease are found much less commonly. Instead, degeneration of the cerebellar granular layer is the most common occurrence.

#### **Renal Lesions in Pregnancy.**

W. E. OBER, D. E. REID, S. L. ROMNEY AND J. P. MERRILL (*Am. J. Med.*, November, 1956) have reviewed the subject of renal lesions and acute renal failure in pregnancy. Some 20% to 40% of cases of acute renal failure are associated with pregnancy complications. The majority of patients in whom acute renal

failure develops and complicates pregnancy suffer from acute tubular necrosis. The common denominator in these cases is shock, due to haemorrhage, intravascular hemolysis or infection. The mortality in this group is 25%. However, the survivors suffer no progressive disease arising from the tubular necrosis. Renal cortical necrosis is an occasional complication of accidental hemorrhage. In the group with this complication, there is moderate to severe renal arteriosclerosis in all cases, and survivors are likely to have some residual renal insufficiency. The authors point out that, in the absence of preexistent renal disease or hypertension, toxæmia of pregnancy does not cause permanent renal lesions, and the oliguria associated with toxæmia is usually extrarenal. The hazard of pyelonephritis complicating pregnancy is emphasized, both from the immediate and from the long-range viewpoints.

### **MORPHOLOGY.**

#### **The Nerve Supply of the Vertebral Column.**

D. L. STILWELL (*Anat. Rec.*, June, 1956) describes the origins and terminations of nerves to structures of the vertebral column and its associated structures in the monkey. In large part these nerves are branches of a segmentally arranged paravertebral plexus which communicates with grey and white sympathetic rami, with spinal and sympathetic ganglia, and with the branches of the dorsal and ventral spinal nerve rami. These communications convey axons of various size and degrees of myelination, and appear to comprise a network of mixed nerves. Somatic sensory and autonomic nerves are given off by the plexus, to end in longitudinal ligaments, blood vessels, bone marrow, periosteum, joints and *dura mater*. A one-segment overlap in the innervation of vertebral structures has been demonstrated, as well as that for the dorsal deep muscles, corresponding to a similar cutaneous dermatome overlap. Such an arrangement may complicate accurate clinical localization of painful sensation arising from these structures, since a similar situation exists in man. Nerve terminations usually considered pain-sensitive have been found in the longitudinal ligaments, in the periosteum of the vertebral bodies, in loose connective tissues at the surfaces of the *annulus fibrosus* and *ligamentum flavum*, in the lumbo-dorsal fascia, and in the fibrous capsules of the vertebral diarthroses, emphasizing the numerous possible sources of pain from spinal structures. The meningeal ramus (recurrent or sinu-vertebral nerve) is both somatic and autonomic in content, is at least two in number to a segment, and supplies sensory and vasomotor nerves to the *dura mater*, the periosteum of the spinal canal, and the posterior longitudinal ligament, as well as to spongy bone of the vertebral bodies and arches. Dorsal rami of the spinal nerves supply the deep dorsal muscles and the periosteum and bone of the vertebral arch, and provide several sensory branches to the inter-vertebral diarthrodial joints. Each joint

receives nerve fibres from two adjacent spinal nerves, entering from a variety of directions, and varying slightly in pattern with the vertebral level. Nerves and their terminations in these joints follow a plan similar to those described in the major joints of other mammals.

### The Persisting Right Sixth Aortic Arch.

R. F. SHANER (*Anat. Rec.*, June, 1956) states that present-day thoracic surgery is stimulating an interest in the right sixth or pulmonary aortic arch. Edwards pointed out in 1948 that this transient arch might persist as an impervious or slightly patent cord that might behave as a traction band and deform the aorta. In addition, the right sixth arch might survive as a well developed functioning vessel and alter the post-natal arterial pattern. At least 16 instances of this sort have been recorded for man, not counting examples found with a right-sided aorta and in conditions of *situs inversus*. Such a right sixth arch recently turned up in the field of a heart operation. A persistent functioning right sixth aortic arch may be another of those rare anomalies which are not so rare, and which have practical significance, and may persist as a functioning vessel and enter into unusual combinations with the great vessels above the heart. Embryonic examples from abnormal pig embryos are described by the author and correlated with neonatal and adult examples in man and the pig. Such abnormal vessel arrangements could be produced by an early developmental arrest leading to the retention of the sixth right arch, and followed by disuse atrophy of those parts of the aortic arch system that have become stagnant segments under the unusual haemodynamic conditions. Normal fetal coarctation of the left aortic arch may arise from several causes; in the pig it appears behind a fold in the dorsal aorta at the mouth of the transient fifth aortic arch. A similar fold begins on the right dorsal aorta. Either alone, or in combination with a persisting right sixth arch, the fold may be a contributing cause for the unusual vessel arrangements of the region.

### Innervation of Teeth and Periodontium.

S. BERNICK (*Anat. Rec.*, June, 1956) finds that the nerve supply to the pulp of the incisors consists of non-medullated nerve fibres which are always intimately associated with blood vessels throughout their course. This direct association with blood vessels leads one to the assumption that the nerves in the pulp of the incisor are autonomic in nature. The nerves to the labial alveolar periosteum of the incisor differ in nature from those of the lingual periodontal membrane. In the former only non-medullated nerve fibres were seen accompanying the blood vessels. On the other hand somatic afferent fibres were observed throughout the lingual periodontal membrane. These terminate among the stroma cells of the membrane. The coronal portion of the pulp of the molars is innervated in the same manner as human molars except for one difference—namely, no terminal nerves were observed entering the predentin and dentin. The

nerve supply to the periodontal membrane arises from the dental and interalveolar branches of the alveolar nerves. The dental nerve fibres supply the periapical area and pass gingivally to form a network with the perforating branches which originate from the interalveolar nerves. The nerves terminate as "free nerve endings" among the cells of the periodontal membrane, the cementoblastic layer and the cementum proper. Gingival innervation is derived from two sources: (i) fibres arising from the nerves of the periodontal membrane, and (ii) fibres originating from the labial or palatal nerves. As these fibres pass through the connective tissue of the gingiva, terminal branches are given off that supply the *tunica propria*. Intraepithelial and intraepithelial nerve endings are scarce. No specialized nerve endings such as Krause's or Meissner's corpuscle were seen in either the periodontal membrane or gingivae.

### Neo-ovogenesis.

G. J. VERMADE-VAN ECK (*Anat. Rec.*, June, 1956) states that from the time of Waldeyer (1870) it has been accepted that the human ovary contained at birth all the oocytes for the future life. More recently the formation of new ova throughout sexual maturity, as in the lower mammals, has been affirmed for man by a number of investigators. The author reviews the latest record on this subject. He states that the problem of post-natal ovogenesis was approached by analysing the number of normal and atretic ova in the Rhesus monkey. Eight immature monkey ovaries (Yale Colony) and six immature and seven mature monkey ovaries (Carnegie Colony) were counted. The counting technique described by Green and Zuckerman in 1950 was used. The follicles were grouped in seven stages ranging from primordial to mature follicles. The normal and atretic ova were determined separately. The number of oocytes differed widely among animals of similar ages. The right and left ovaries of one monkey usually contained about equal numbers of oocytes. The averages of the total number of oocytes for the three groups ranged between 50,120±10,600 and 60,810±16,470 per ovary, with an average atresia of 4.1%±0.5% to 4.8%±0.5%. The distribution in the different stages of follicle development was constant. The percentage of atretic ova was also constant for each group. The duration of the atresia was determined by irradiation of the ovary with doses adequate to destroy all growing follicles. Atresia after irradiation occurred in seven days. The average and maximum life of the oocytes was calculated (about six months and two years respectively), as was the average time required for the growth of the mature follicle from the large primary follicle (four to six weeks).

### Innervation of Pancreas.

R. HONJIN (*J. Comp. Neurol.*, June, 1956) presents a study of the innervation of the pancreas of the mouse, based upon neuro-histological observation by means of the vital methylene blue technique, silver impregnation methods and myelin technique, as well as by experimental degeneration after the section of the

cervical vagus. The intrapancreatic nerves form periacinous, periinsular and perivascular plexuses. The small intrapancreatic ganglia are found in the interlobular connective tissue, between the acini and around the islets. They lie on or near the course of nerve plexuses. Some of the extrinsic nerve fibres terminate on the nerve cell bodies in the intrapancreatic ganglia in the form of pericellular endings. Some of them are apparently pre-ganglionic fibres derived from the vagus. This is shown by the degeneration of a part of the medullated nerve fibres and pericellular endings after the section of each cervical vagus. In all the pancreatic tissues, a large syncytial anastomosing network of the interstitial cells of Cajal is found. This represents the extreme peripheral part of the vegetative nervous system. These cells are of a nervous nature because they show a neurofibrillar network around the nucleus and are selectively stained with methylene blue, thus showing metachromatism. The network of the interstitial cells has syncytial connexions with the processes of the intrapancreatic nerve cells and the extrinsic non-medullated fibres. The neural terminal net is unaffected by degeneration of the vagus. The vegetative efferent nervous system is composed of two different components—neurons and a large syncytial terminal net. The former terminate in the form of pericellular endings on the local argentophobe nerve cells, which are the starting points of the latter. This latter is a large syncytial net system, which is composed of the interstitial cells of Cajal and the local argentophobe nerve cells. The interstitial cells of Cajal are true nerve cells and intervene between the argentophobe nerve cells and the effector cells. A small number of afferent endings are recognized in the interlobular connective tissue, in the interacinous space and on the walls of the large arteries. Some of them are shown to be of vagal origin.

### Growth of Foot.

M. ANDERSON, M. BLAIS AND W. T. GREEN (*Am. J. Phys. Anthropol.*, June, 1956) describe the growth of the normal foot from one to eighteen years of age for the male and female based on measurements of 532 subjects. The changing interrelationships of the foot, the lower extremity, and stature, as well as the changing rates of growth in these areas from one age to another, were defined for the child from one to eighteen years of age. The foot was found to grow in synchrony with the body as a whole rather than with the lower extremity of which it is a part; the length from heel to toe maintained the same relationship to the length from heel to head at all ages during which the foot was increasing in size. In general, the early-adolescent spurt in the rate of growth in the foot preceded that in the long bones and in stature by six to eighteen months; growth in the foot and the long bones tended to terminate three years after their maximum rates were reached, whereas stature continued to increase for an average of 4.5 years after its "peak" interval. Cessation of growth, then, occurred first in the foot, next in the long bones, and last in stature.



## British Medical Association News.

### SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association, in conjunction with a meeting of the Post-Graduate Committee in Medicine in the University of Sydney, was held on November 2, 1956, at the Robert H. Todd Assembly Hall, British Medical Association House, 135 Macquarie Street, Sydney. Dr. E. F. THOMSON, the President, in the chair.

#### Rehabilitation.

PROFESSOR HOWARD RUSK, Professor and Chairman, Department of Physical Medicine and Rehabilitation, New York University, Bellevue Medical Center, New York City, read a paper entitled "Rehabilitation" (see page 593).

Dr. Thomson, from the chair, said that it was always a pleasure to listen to an authority when he was sincere; those present had listened to an authority who was sincere. Rehabilitation was something that had to be faced in Australia, and perhaps the first step in rehabilitation was that doctors should rehabilitate themselves and become sincere in their desire to rehabilitate those who were suffering. Dr. Rusk's address should be an inspiration to all. Dr. Thomson expressed the deep gratitude of those present to Dr. Rusk for his inspiring, sincere and authoritative talk.

Dr. R. A. MONEY said that he had been particularly interested in the subject of paraplegia for some years. Three years earlier he had had the privilege of visiting Dr. Rusk's Institute and seeing some of the work that was accomplished there. Dr. Money said that he really went there because during World War II there was treated in his hospital in Palestine a young submarine officer who had survived about three years' warfare in the Atlantic and the Mediterranean; in Haifa one night he went to a party, and thought he was walking out a door, and it happened to be a window, 20 feet above the ground. He had paraplegia following a fracture-dislocation of the twelfth thoracic and first lumbar vertebrae. At that time he was aged twenty-one years, and was a very bright lad with a good brain. Dr. Money said that in his treatment they did one of the things about which they could feel some satisfaction, and which helped to bring about his early rehabilitation; they did not tell him that he would never walk again. That was a very important point that Dr. Rusk had brought out; nobody must ever tell such patients that they would never recover. Dr. Money said that, in London, he had since had the satisfaction of being called for by that young man, taken to his home to lunch and subsequently driven to the airport; all that was accomplished in his own motor-car, which he drove himself, with the help of the light, portable appliances that were given to him at Dr. Rusk's Institute. Dr. Money said that at the Royal Prince Alfred Hospital in Australia an attempt was being made in a small way to follow some of Dr. Rusk's principles, but they had had a disappointment a few weeks previously, when they were told by the Hospitals Commission that, owing to the shortage of funds, the paraplegic centre which they thought they were getting at their convalescent hospital, and for which tenders were about to be called, had been shelved. Thus one of the questions Dr. Money wanted to ask Dr. Rusk was how to persuade the "powers that be", who had the money, to give it to the people who wanted to use it for the rehabilitation of paraplegics.

Dr. Rusk, in reply, said that he defied anybody to ask a question about a problem that they had not had, and Dr. Money's problem had been one. Dr. Rusk said that in the United States, rehabilitation had been "sold"; but there were not good rehabilitation centres on every street corner—they could be counted on one's hands and feet. When it was realized that in their State and Federal programmes they rehabilitated 70,000 people a year, there was a 2,000,000 backlog and they had 350,000 new patients, one could see how they were attacking the problem. Rehabilitation was "sold" on pure economics. In the United States they had been able to show that for every person rehabilitated they got \$10 back for every dollar spent—tax dollars, on people who left the rehabilitation centre and went to work and got off the public relief, and did not think about pensions, but thought about place in life. The emphasis had to be on production. In the New York City hospitals they had all the people that they could use, because their chronic disease hospital, with a dynamic programme, in a year made five times as much money for the city in saving on those patients

who were rehabilitated and discharged as it cost to run the whole programme. Dr. Rusk said that he could provide the documentation of that fact, to be passed on to the "powers that be". A few key cases like the one quoted by Dr. Money could be used. Dr. Rusk said that he had seen a boy in Hawaii three days previously, whom he had seen three years previously in the chronic disease hospital. He was a quadriplegic; he was bright. He had been in the hospital twelve years, as the result of a surf roll that had broken his neck. He had been taken as the first patient in their rehabilitation programme by one of Dr. Rusk's young men, who now ran the programme at the children's hospital in Hawaii. That young man took the boy with the broken neck, who was trained in five months. The boy now had three jobs; he was a licensed real estate and insurance broker, and he had a telephone answering service, and he was about to be married. Another job in addition came from the fact that he was completely self-sufficient, and he had such great self-respect that he was trying to pay back a little to the community that furnished his hospital training. It took only two or three like that to set off the spark that would light up the whole flame. The interest was there, everywhere one went. Dr. Rusk said that he had seen it in the Soviet Union two months previously. Wherever one went the ground was ploughed, the seeds were in, and all that was needed was a little water. Dr. Rusk praised what was being done in Australia; he said that probably many people did not even know about it. He pleaded with those present to make rehabilitation a part of their general hospital care. The centres should be for the severely disabled; all the other should come as an integral part of medical responsibility, and should all be done in one place; otherwise the problem could never be met.

Dr. NAOMI WING said that she was most grateful to Dr. Rusk for talking about the hemiplegics. At the present time they were trying hard to "sell" to the general practitioner the idea that the hemiplegic was no longer a "lost cause". Dr. Wing reminded those present of the tragic incident some weeks previously in which Dr. Edward Brochie and his sister were blown to pieces by a bomb placed in his car. Unfortunately that bomb went through the house next door, where an elderly woman was living; she immediately had a cerebral catastrophe. The next day she was admitted to the Royal South Sydney Hospital, completely unconscious. She recovered after forty-eight hours, aphasic and with loss of bowel and bladder function and complete paralysis of her right arm and leg. Dr. Wing said that they had immediately instituted the programme detailed by Dr. Rusk, which they had learned from his techniques. At the time of the meeting, after a short period of less than eight weeks, she was speaking normally, had complete control of her bowel and bladder function, was able to walk and was almost able to use her right arm. Dr. Wing felt that that was a great victory. She had told the story to impress on those present that if the general practitioners would follow Dr. Rusk's techniques and carry out the treatment in the patient's homes, they would no longer need to bring for rehabilitation patients whose condition was hopeless, because prophylactic measures had not been instituted immediately after their cerebral catastrophe had occurred.

Dr. Rusk, in reply, said that he was in absolute agreement with what Dr. Wing had said. At the Bellevue Center they had worked out a monograph that gave every single step in the training of the hemiplegic. If anybody wanted it, he would see that it was made available in quantity, so that every medical practitioner in Australia could have a copy. There was no excuse for not looking after the hemiplegics. It was unconscionable for hospitals to say: "You can't keep this person in here any longer—this is an acute hospital. He is a hemiplegic, a 'crock'—get him out." Dr. Rusk said that no hospitals would dare to say to an orthopaedic surgeon: "You can't bring this man in for another spinal fusion; he'd have to be in hospital for three months. This is an acute hospital." Dr. Rusk thought it just as much malpractice to turn out a hemiplegic before he was properly trained as it was to apply ice-bags and give bismuth to someone who was thought to have acute appendicitis. There was no excuse for not giving proper therapy to the aphasic, even if there was no speech therapist available. They had worked out a simple manual that a family could take, with objects and words and directions day by day. Once the patient's condition had been evaluated, the treatment could be given at home. It was all available, and all that had to be done was that somebody should read the directions and take the pains to do what was required. It had been proved to be effective. Dr. Rusk said that he did not want to seem too evangelical, although he could not help it when he talked about that type of thing; but the knowledge was



there, and the results had been reported, not only from his clinic, but from many. He emphasized that those results could be obtained, and that something could be done for that great forgotten group. He laid stress on the fact that it was an old wives' tale that a person who had had one stroke would have two, three and more. His chance of having a second stroke was no more than that of anyone else in that age group. If a hypertensive was put in the training programme for hemiplegics, where he had hope and opportunity and an outlet for his fear and anxiety, his blood pressure would drop from 20 to 40 points, and would be maintained at that level right through his training period. Having seen 2500 such patients, they had never seen a second cerebral accident during the training period, and among the 2500, only three such accidents, which had happened during the night, had occurred while the patient was in the hospital.

Dr. G. G. BURNISTON said that, as one who had been working in rehabilitation for many years, and who was aware of the problem as a community one and especially of the need for better medical appreciation, he thanked Dr. Rusk profoundly for having come to Australia and for having spoken as he had. Dr. Rusk had come at the right time, because just now there was a great awakening of medical practitioners to their responsibility in the total care of their patients. Dr. Rusk since his arrival had often said that doctors had been busy with the therapeutics of medicine and with the problem of acute illness, but they had not given enough attention to see the great medico-social problem of chronic disability. Dr. Burniston thought that in the future, largely thanks to Dr. Rusk, many of those present and others would be aware of the problem, and would assume the responsibility, which was certainly theirs, for its adequate solution.

Dr. Rusk, in reply, said that he hoped they would not learn it the hard way. It might interest them to know that one-third of all the private patients who entered their institute were either doctors or doctors' friends.

Dr. E. HASLETT FRAZER thanked Dr. Rusk for his interesting address. He said that he did not know much about rehabilitation, except with regard to backache, but he had visited overseas a number of authorities, and had spent some time in Dr. Rusk's department on various occasions. What had struck him most there was the spirit of optimism and the unending patience, and particularly the psychological approach. Dr. Haslett Frazer said that he had dabbled for many years in psychiatry, and he stressed the importance of Dr. Rusk's recommendation that the attending doctor should spend even only five minutes in talking to the patient and explaining the situation to him, to give him confidence. Dr. Haslett Frazer said that no matter what the complaint was, if it had any psychosomatic trend, the doctor would do more good by that simple measure than by all the appliances that could be provided. Dr. Haslett Frazer had been greatly impressed by what he saw at Dr. Rusk's clinic, and wished that everyone present could go there and see for himself. The time was rapidly approaching when there would be a very big future for rehabilitation.

Dr. Rusk, in reply, said that he was grateful for what Dr. Haslett Frazer had said about his clinic, and would convey it to his staff. About 55% of their patients had emotional problems, and if they were not met, the success of the training programme would be jeopardized. Physical medicine was only one corner-stone; psychiatry and the meeting of emotional problems were just as important. They not only helped the patient, but they helped the therapists and the physicians and the whole staff in the approach to the patient's problems. It all had to be tailor-made, because everybody was different.

## Public Health.

### STREPTOCOCCAL PROPHYLAXIS IN RHEUMATIC FEVER AND CHOREA: INSTITUTE OF CHILD HEALTH, SYDNEY.

It is now generally agreed that early and adequate treatment of hemolytic streptococcal infection will usually prevent rheumatic fever. Recurrence of rheumatic fever is similarly preventable.

Streptococcal prophylaxis for the child who has already suffered one attack of acute rheumatism or of chorea involves (i) eradication of hemolytic streptococci, (ii) con-

tinuous prophylaxis throughout childhood and adolescence, (iii) adequate treatment of intercurrent streptococcal infection, and (iv) penicillin "cover" for operative procedures.

The following regime is at present in use at the Institute of Child Health, Sydney, and is offered as a guide to medical practitioners.

#### Eradication of Hemolytic Streptococci.

Eradication of hemolytic streptococci is the beginning of prophylaxis. This should commence as soon as the diagnosis is definite, even though attempted culture from the initial throat swabbing fails to yield a growth of hemolytic streptococci (group A).

A single intramuscular injection of a preparation containing benzathine, procaine and crystalline penicillin is recommended.<sup>1</sup> Continuous oral prophylaxis should begin one week later.

#### Continuous Oral Prophylaxis.

For the purpose of continuous oral prophylaxis, either penicillin or sulphadiazine is employed. If penicillin is used, 200,000 units of crystalline penicillin are given twice daily by mouth half an hour before food. If sulphadiazine is chosen, 0.5 gramme is given twice daily by mouth.

Oral prophylaxis should continue throughout childhood and adolescence, and probably for longer. The period of greatest risk after the initial attack of rheumatic fever is the first five years.

#### Adequate Treatment of Streptococcal Infection.

Adequate treatment of intercurrent hemolytic streptococcal infection is necessary even though continuous prophylaxis is being given. All sore throats in the rheumatic child should be presumed streptococcal unless proven otherwise.

Penicillin is the drug of choice. For total eradication of hemolytic streptococci and prevention of rheumatic recurrence, an adequate serum penicillin level must be maintained for at least ten days, even though symptoms usually disappear rapidly. This may be achieved by either of the following measures: (a) a single intramuscular injection of a preparation containing benzathine, procaine and crystalline penicillin in appropriate dosage;<sup>1</sup> (b) the oral administration of one to two million units per day of crystalline "Penicillin G" in four divided doses; this must be continued for at least ten days. Phenoxymethyl penicillin ("Penicillin V") may possibly prove useful for this purpose.

The sulphonamides are not recommended for the treatment of hemolytic streptococcal infections. Wide-spectrum antibiotics are seldom indicated.

#### Penicillin "Cover" for Operative Procedures.

There is no evidence that removal of the tonsils or adenoids prevents the occurrence or recurrence of rheumatic fever or of chorea. When, for other reasons, these operations are thought necessary, adequate penicillin "cover" is recommended for the rheumatic child. Adequate "cover" is also essential for dental procedures. For example, a single intramuscular injection of a preparation containing benzathine, procaine and crystalline penicillin<sup>1</sup> in appropriate dosage is given one hour before operation.

## Out of the Past.

*In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.*

### LIEUTENANT GOVERNOR KING TO UNDER SECRETARY NEPEAN.<sup>2</sup>

London 5 January 1791.

The Supply sailed from Port Jackson on April 17th 1790 and arrived in Batavia July 6th. Of the 4th August I left that port having taken my passage on board the Snelheid a Dutch packet. A putrid fever made its appearance soon

<sup>1</sup> "Bicillin (Penidural) All-Purpose" (Wyeth).

<sup>2</sup> From the original in the Mitchell Library, Sydney.

after sailing which in a few days carried off a part of the crew: and the Officers, with the rest of the people, being in a dying State, it was found necessary to bear up for the Mauritius where we arrived on 4th September. Being in an ill state of health I staid on shore during the time the vessel was at this port. On the 17th September the packet sailed having entered a new crew the captain and six men having died on the passage from Batavia to the Mauritius.

## Correspondence.

### UNSATISFACTORY TETANUS PROPHYLAXIS.

SIR: This hospital treats a large number of accident cases, many of whom require tetanus prophylaxis. The great majority have not been immunized against tetanus and thus must receive tetanus antitoxin (A.T.S.).

In view of reliable evidence that one dose of A.T.S. may reduce or nullify the effect of any subsequent A.T.S., these patients would appear to be subjected to a greater risk of tetanus from any subsequent injury, unless actively immunized in the interim. Quite apart from their reduced efficiency, of course, second injections of A.T.S. carry a higher risk of serum reactions. Thus, although A.T.S. is essential for the protection of the unimmunized, the price of that protection may be fatal tetanus or serum reaction following correct prophylaxis for injuries sustained later in life.

The Subcommittee on Tetanus Prophylaxis of this hospital, Dr. C. E. Winston, Dr. J. P. Markell, Dr. Z. S. Freeman and Dr. A. C. Bowring, recommends that all patients who receive A.T.S. should commence immunization three weeks later. This will be done by the hospital when the patients are still in hospital after three weeks. The rest of the patients will be advised to do so on a printed sheet. We intend to refer the patients to their own doctors with a covering letter which, to ensure delivery of both, is printed on the reverse side of the notice to the patient.

The problem will be reduced in time if practitioners will immunize children against tetanus in conjunction with diphtheria immunization, and will also immunize those adults whose occupations expose them to risk of repeated injury. We would be grateful, therefore, if you would publish this letter along with the copies of the notice to patients and letters to doctors.

Yours, etc.,

A. C. BOWRING, F.R.C.S., F.R.C.S. (Edin.),  
Medical Superintendent.

Royal South Sydney Hospital,  
Joynton Avenue,  
Zetland.

April 9, 1957.

### Notice to Patients who have Received Tetanus Antitoxin.

It has been necessary to give you an injection to protect you from tetanus as a result of your injury.

However, although this injection gives you protection for the next few days, it renders you more susceptible to tetanus in the future as repeated injections of this type have less effect each time you receive them.

In order to obtain lasting protection against tetanus you are strongly advised to consult your own doctor (we have written to him on the back of this note, asking him for his co-operation) so that he can give you immunization against tetanus.

This immunization should commence three weeks from now.

Dear Doctor,

At this hospital we treat a large number of accident cases who require tetanus prophylaxis. Therefore, we view with grave concern the growing proof that A.T.S., besides giving a temporary passive immunity against *Cl. tetani*, also produces antibody reactions in the patient, which reduce or nullify the benefit of subsequent A.T.S. injections, even though a period of years may have elapsed between the two doses.

Thus our use of A.T.S., although essential at the time, is producing an increasing number of patients in whom A.T.S. will not prevent tetanus. This, combined

with the not insignificant incidence of serum reactions, has caused the Subcommittee on Tetanus Prophylaxis of this hospital to advocate active immunization of all patients who have received A.T.S.

We have taken the liberty of advising your patient to consult you in this regard, and trust that you will favour us with your co-operation in this campaign.

Yours, etc.,

A. C. BOWRING, F.R.C.S., F.R.C.S. (Edin.),  
Medical Superintendent.

### HOBART CONGRESS.

SIR: Readers will appreciate the difficulties which face the small number of members in Tasmania in staging a congress comparable to that held in Sydney in 1955.

As organizer of the Scientific Exhibition, I appeal to mainland members and organizations to forward to me as soon as possible information concerning the nature and extent of material which can be made available for the above exhibition.

Local material at my disposal will be used as much as possible, but unless mainland members contribute freely, the Scientific Exhibition cannot be staged successfully.

Yours, etc.,

Mayoral Hobart Hospital,  
Tasmania,  
March 21, 1957.

CAMPBELL DUNCAN.

## Medical Practice.

### A SUGGESTED PROCEDURE IN THE GIVING OF HORSE SERUM BY INJECTION, PARTICULARLY TETANUS ANTITOXIN.

In August, 1956, the members of the Section for the Study of Allergic Diseases of the Victorian Branch of the British Medical Association appointed a subcommittee, comprising the heads of allergy clinics of the Melbourne teaching hospitals, to make recommendations concerning "A Suggested Procedure in the Giving of Horse Serum by Injection, Particularly Tetanus Antitoxin". The findings of the subcommittee were accepted unanimously at the March meeting of the Section. We have received for publication, from Dr. Alan Murray, the Honorary Secretary-Treasurer of the Section, a statement of the findings. The statement is signed by V. G. Bristow (Alfred Hospital), R. H. O. Donald (Royal Melbourne Hospital), P. Ward Farmer (Prince Henry's Hospital), D. A. Prentice (Saint Vincent's Hospital) and S. Wiener (coopted), and is as follows:

When it has been decided to give tetanus antitoxin, the main concern is to detect a possible serum sensitivity and avoid anaphylaxis. Severe reactions may occur in patients being injected for the first time, and these are "naturally sensitive" to horse serum. They are often sensitive to horse dander and have suffered or suffer from atopic eczema, hay fever or asthma, but a negative history of allergy does not rule out sensitivity; for instance, the patient may have forgotten, or did not know, that he suffered from eczema. A family background of allergy should also make one cautious. There is a difference of opinion about the value of skin testing; for instance, Laurent and Parish (1952) place no reliance on skin reactions, and advise a subcutaneous trial dose of diluted or undiluted serum, followed by observation of the patient for half an hour. Nevertheless, as we have at times seen a nearly fatal outcome with an intradermal test with undiluted serum, we would recommend in all cases that an intradermal test dose of 0.02 cubic centimetre of 1 in 10 dilution of tetanus antitoxin be injected intradermally on the volar aspect of the forearm, using a tuberculin syringe, and that a control intradermal test with normal saline be carried out about two inches away from the serum test. The result should be read in fifteen minutes, a positive reaction being shown by wealing, erythema and itchiness at the site of the serum injection, but not at the control site. If a positive skin reaction results with constitutional symptoms, no further antitoxin should be given until the merits of the case have been evaluated as below. If a positive skin reaction occurs without a general reaction,

a further test dose with 0.05 cubic centimetre of undiluted serum should be injected subcutaneously and the patient watched carefully for another half-hour. If no symptoms follow this test dose, it should be safe to inject the remainder of the antitoxin with observation for a further half-hour. Whenever antitoxin is being administered, a syringe, 1 in 1000 adrenaline solution, some form of injectible antihistamine and a tourniquet should be on hand. Whatever method is used for testing, it cannot be stressed too strongly that the patient should be under observation for at least half an hour after any injection, and the physician should be ready to treat anaphylaxis if it occurs. Prompt action is required in treating anaphylaxis, and a tourniquet should be applied above the site of the serum injection, and, in the case of an adult, 10 to 15 minims of adrenaline solution, 1 in 1000, should be injected intramuscularly into the other arm, and a further dose may need to be given ten to fifteen minutes later. In addition, some form of antihistamine preparation should be injected parenterally and supplemented by the use of a liquid preparation of antihistamine, given orally.

In all patients who react constitutionally to either an intradermal or subcutaneous test dose of antitoxin, the physician will have to review the need for antitoxin administration. If it is decided that it is absolutely necessary to give tetanus antitoxin to a sensitive patient, after considering the nature of the injury and taking into account that a sensitive patient excretes antitoxin more rapidly and active immunization has not been given previously, then gradually increasing amounts of antitoxin could be tried under cover of antihistamine and adrenaline injections; but it would be safer to consult a trained allergist, as the procedure is not without risk.

In casualty departments there should be written rules for procedure and skin testing, and trial injections should be done by the resident medical officer and not by the nurse. A special tray containing testing materials, adrenaline, tourniquet *et cetera* should always be on hand.

All patients who receive tetanus antitoxin should have their first dose of toxoid three weeks after the injection of tetanus antitoxin. Universal active immunization with tetanus toxoid should be the aim of the medical profession, and the ideal would be for every patient immunized to carry a card stating what immunizing injections have been given.

#### Reference.

LAURENT, L. J. M., and PARISH, H. J. (1952), "Serum Reactions and Serum Sensitivity Tests", *Brit. M. J.*, 1: 1294.

### Obituary.

#### SIR JOHN NEWMAN-MORRIS.

THE death of Sir John Newman-Morris in Melbourne on January 3, 1957, at the age of seventy-seven years, brought to a close the career of one of Victoria's most distinguished medical men. Born in Melbourne on March 2, 1879, John Newman-Morris was the son of William Alfred Morris, who was the President of the Commercial Travellers Association of Victoria in 1896; his mother was Ellen Newman. He was educated at Hawthorn College, Melbourne, and Queen's College, University of Melbourne. Whilst at the University he played lacrosse for Victoria and was awarded a "Blue" for this sport. During his course he taught for some years at Caulfield Grammar School. He graduated in medicine and surgery from the University of Melbourne in 1903. After a period as a resident medical officer he commenced practice in Violet Town, Victoria, in 1905, when his practice was conducted mainly with the help of a buggy and a very smart pair of ponies, of which he was very proud. He married in 1905 Eleanor Annie Jones, who died in 1949. In 1911 he commenced practice in Auburn, a suburb of Melbourne, and he practised there until 1932; from that year his practice was confined to Collins Street, Melbourne. He was elected a Fellow of the Royal Australasian College of Surgeons and of the American College of Surgeons in 1928. He was created a Commander of the Most Distinguished Order of St. Michael and St. George in 1938, a Knight of St. John in 1945, and a Knight Bachelor in 1948.

In his lifetime, Sir John Newman-Morris served his profession and the community in many ways. The list of his public appointments is remarkable for its length and variety, and we can only mention the most important of them. He was a member of the Charities Board of Victoria

from 1929 and was its Chairman in 1936-1937. A member of the Medical Board of Victoria from 1930, he was its President from 1945 till his death. He was a Trustee of the Medical Society of Victoria from 1930, a member of the Council of the Victorian Branch of the British Medical Association from 1918, Chairman of Council from 1922 to 1939, and President of the Branch in 1927 and 1928. He was a member of the Victorian State Committee of the Royal Australasian College of Surgeons from 1929 to 1947. He served as an honorary surgeon on the staff of Saint Vincent's Hospital, Melbourne, from 1915 till 1938, when he became a consulting surgeon. From 1929 to 1939 he was the Victorian representative and Vice-President on first the Federal Committee and then the Federal Council of the British Medical Association in Australia, as well as being a Vice-President of the Fifth Session of the Australasian Medical Congress (British Medical Association) in 1937 and President of the Eighth Session in 1952. In the Australian Red Cross Society



he was a member of the Council of the Victorian Division, as well as Chairman of both the Council and the Blood Transfusion Committee from 1938 to 1944; he was the Victorian representative on the Council of the Society, a member of the Executive from 1938 to 1944, and Chairman of both the Council and the Executive from 1944. He was the first President of both the Victorian section and the Federal Council of the Flying Doctor Service of Australia, and was a member of the Council for many years. In the Priory of the Order of St. John of Jerusalem in Australia, he was the Victorian member of the Executive and Treasurer from 1942 and Receiver-General from 1954. A member of the Council of the St. John Ambulance Association from 1930, he was its President on two occasions. He was also closely associated with the work of the St. John Ambulance Brigade and the Voluntary Aid Detachments, both in the Victorian and in the Federal spheres. He was a member of the National Health and Medical Research Council from 1937 to 1943, and a member of the Central Medical Coordination Committee from 1938 to 1946. He was President of the Victorian Institute of Hospital Almoners, of the Victorian Council of Social Training, of the Victorian Branch of the Royal Empire Society and of the Medical Defence Association of Victoria, and Vice-President of the Victorian Society for Crippled Children. He was Chairman of Directors of the British Medical Insurance Company, of the Automobile, Fire and General Insurance Company, of General Credits, Limited, of H. L. Finlay (Proprietary), Limited, and of the British Medical Agency. He was also a member of the Citizens Olympic Committee, of the Council and Executive of the Lord Mayor's Fund for Metropolitan Hospitals and Charities, and of the Anti-Cancer Council of Victoria.



Sir John Newman-Morris was a medical member of the Standing Committee of Convocation of the University of Melbourne from 1929, a member of the Board of Social Studies from 1942, a tutor and examiner in clinical surgery from 1938, a member of the Council of the University from 1949 to 1955, and Deputy Chancellor from 1951 to 1953. He also served on the Councils of the Trinity Grammar School, Kew, and of Tintern Church of England Girls' Grammar School.

This list of Sir John Newman-Morris's public appointments is not complete. We have mentioned only the most important of them. However, it serves to indicate the notable contribution which he made to the life of the community, and the breadth and depth of his interests and sympathy. He will be mourned and missed by many.

At its meeting on January 23, 1957, the Council of the Victorian Branch of the British Medical Association passed the following minute:

The Council of the Victorian Branch of the British Medical Association records with profound regret the death of John Newman-Morris, Knight Bachelor, C.M.G., Knight of St. John, and Fellow of the Royal Australasian and American Colleges of Surgeons.

His services to the medical profession as a member of the Council of the Victorian Branch of the British Medical Association and sometime its President and Chairman, as a Trustee of the Medical Society of Victoria, as a member of the Federal Council of the Association in Australia, as President of the Eighth Session of the Australasian Medical Congress, and as the Chairman of the British Medical Insurance Company were outstanding.

His membership of the Standing Committee of Convocation and of the Council of the University of Melbourne, of which he was for a period Deputy Chancellor, his Presidency of the Medical Board of Victoria, of the St. John Ambulance Association and of the Australian Red Cross Society, exemplify his services to education and the community, but the naming of those offices does no more than reveal a small number of the offices he held in organizations devoted to the welfare of the people of Victoria.

Council extends its sympathy to his son and daughter, Dr. Geoffrey Newman-Morris and Mrs. Standish.

DR. A. E. ROWDEN WHITE writes: The death of Sir John Newman-Morris is a great loss to the medical profession and the community in general. In the long years since he qualified he has led a very active life, first in general practice in the country and later as a general practitioner in the suburb of Hawthorn, and consulting surgeon to Saint Vincent's Hospital, Melbourne. He was endowed with an abundance of energy, and it was not long before he found an outlet in that direction by election to the Council of the British Medical Association. It was a period when there were only a few hundred members; and although signs were noticeable that it was rapidly growing, it has expanded at the present time to almost 3000. Naturally, the work of the Council increased enormously, and its solution lay in the appointment of several committees; Morris was elected chairman of each of them. As a result, concise reports were made to Council, the latter being relieved of many meetings which otherwise must have occurred. The Council benefited, and so did Morris, who developed into an excellent chairman. He was much in evidence in the thirty years which followed, for his great ability and capacity to control and handle every kind of difficult problem that arose in meetings and discussions. He could always be relied upon for good advice and sound judgement. The British Medical Association owes much to Morris's wisdom, and it may be said that he has been one of the most outstanding and successful leaders of the Association in the past fifty years.

Chatting with him just before the first and only meeting of the parent British Medical Association in Melbourne in 1935, I asked how many meetings he had attended in the past three weeks of the month: his calculation was 18. Such was his enthusiasm and unbounded energy. His popularity was very great, and he was assured of being elected President on that memorable occasion, but withdrew his nomination at the last moment.

By the end of 1919 most of the medical officers of the Australian Imperial Force overseas had been repatriated to Australia, and many of the young men felt that they were lacking in experience and knowledge of their work and appealed to their seniors in the metropolitan hospitals in Melbourne. A meeting was called, and after discussion it was decided to arrange a refresher course to be given by the

senior physicians and surgeons of the Melbourne, Alfred and Saint Vincent's Hospitals; the committee was to be known as The Melbourne Permanent Post-Graduate Committee. Young doctors came from all the States for this first refresher course, which was an unqualified success. Morris was co-opted for the second and subsequent years of "Refreshers" because of his ability and useful and constructive criticisms, and it should be recorded that months before his death the Committee appointed him Emeritus Councillor of that body.

Some time before World War II the Red Cross Society's organization was developing rapidly, and its noble claims on the community were being well recognized. Morris's ability was at its best, in the high position he held, in expediting Red Cross work, especially when Mussolini's Italian army ruthlessly invaded Greece, and the latter appealed to the Allies for assistance. Within a few hours, Morris arranged for thousands of pounds' worth of Red Cross gifts of goods, clothing and medical supplies, as well as large sums of money, which received not only grateful thanks from the noble Greeks, but high commendation from our own Government and approval of our citizens for the celerity with which these efforts were put into effect. Morris received a well-earned knighthood.

Red Cross work expanded enormously, and Morris was asked to visit England to cooperate with the Red Cross work there. The Queen, as patron and an active worker, was naturally interested, and at her invitation Morris visited Buckingham Palace to discuss the Society's problems at home and in Australia. The Princesses also entered into the discussions.

After World War II Sir John became a member of the Standing Committee of Convocation of the University of Melbourne and in due course was elected to the Council, where his activities and wisdom were so helpful that he was elected Deputy Chancellor for two years. His organizing ability and insatiable capacity for work became so well known throughout the States that he became the popular choice for the Presidency of the Eighth Session of the Australasian Medical Congress (British Medical Association). He saw to it that the vice-presidents and the various subcommittees were well coached in every detail to make the Congress go off without a hitch. His calm dignity and excellent and well-delivered presidential address made the occasion one of the most notable of the series in the past fifty years.

I have recorded four of the important self-imposed duties of Sir John Newman-Morris's very busy life; there were two dozen other official positions, recorded elsewhere, which he held to everyone's satisfaction. He seemed indefatigable, giving time and hearing to each problem as it arose, with the appropriate solution in due course. In the fifty years of a very close friendship I have the happiest memories and associations of a staunch and lovable man of the highest ideals and integrity and possessing the kindest disposition.

SIR PETER MACCALLUM writes: Sir John Newman-Morris could find full scope for the wide range of his generous spirit and talent only in a world organization. In the soil of Red Cross his genius flowered with a profusion that enriched the harvest of its humanitarian purpose. He imparted to its work new strength, and it was through him that the vigour of its growth found the international expression that has given the Australian Red Cross Society its present high repute abroad.

It is little wonder that with the news of his death tributes poured into the Society from all quarters, bearing witness to the pronouncement of M. Paul Ruegger, Chairman of the International Red Cross Committee, on the occasion of Sir John's retirement from the Australian chairmanship, that this leader was at that time "one of the greatest living exponents of Red Cross principles".

It was under his guidance that, after the wartime activity of 1939 to 1945, Red Cross for the first time since its inception developed a full-scale peace-time programme—a most momentous transition. To his vision and energy was due the fact that Australia has the distinction of being the first country in the world to have a blood transfusion service on a nation-wide basis—again a conception of the first magnitude. It was he who in Japan and Korea, in the first war waged by the United Nations, successfully organized the Red Cross service of the British Commonwealth Units, and whose vivid foresight planned the triumphant smoothness of the reception of the prisoners of war that marked the end of the fighting.

He joined the Victorian Divisional Council of the Australian Red Cross Society in 1937, became its Chairman in

1938, and relinquished that office to become the National Chairman in 1943—an office he held till 1951. During that time he led many Australian delegations on the business of the Society overseas. He was heard and heeded, and the wisdom of his counsel sought increasingly with the years at meetings of the Executive Committee of the League, of its Board of Governors, at international Red Cross conferences, and at conferences for the basic study of the problems of the Geneva conventions. His work for the Society took him to many countries in Europe, Asia and America; he visited the Philippines, and in the field led missions to Japan and Korea, Siam and Indonesia. Consequently he spoke with authority. His voice became the voice of a world leader; his prestige a proud Australian attainment.

His humanity and gift of friendliness, his good sense and sureness of judgement, his even manner, calm simplicity, dignity and obvious sincerity lent weight and power to his utterances on all occasions. His sanguine temperament and greatheartedness, too, were ideal attributes in a Red Cross leader, his greatest role. These qualities shone through and characterized all his abundant activities.

Naturally, many honours came to him. They will continue, too, in the memorials that mark what he has done. The sum of his doings is great indeed. This was a man.

DR. LEONARD BALL writes: In 1929, on my return from abroad, my first venture into practice was as an assistant to the late Dr. J. H. Bennett in Hawthorn. At that time Dr. (as he was then) John Newman-Morris practised close by, and it was, of course, the correct thing for me to have called on him. However, owing to diffidence or, perhaps, laziness I did not do so, and Sir John called on me. Not only did he make me welcome to the district, but he invited me to play tennis on his court on Saturday afternoons, where I met, amongst others, Dr. H. Cecil Colville, Dr. Walter Summons, Dr. W. Begg and the late Dr. L. S. Latham.

Soon afterwards I married, and Sir John and Lady Morris made us very welcome to their happy home life. My wife, newly arrived from Britain, was a stranger in a strange land, but Lady Morris in a kindly motherly way took her "under her wing", introduced her to a wide circle of friends and helped her to learn the duties of a doctor's wife.

Sir John Newman-Morris practised in Hawthorn for many years; he became almost an institution there. He was the undoubted leader of the profession in the Eastern Subdivision, in addition to his many other activities, and at the same time conducted a very large general practice. In the early nineteen thirties, he relinquished his general practice, but he still retained our friendship. He had quite naturally earned a reputation, after years of practice conducted on the highest ethical standards, for wisdom and sagacity; and when problems arose, it was to him that we all went for advice and help.

When I succeeded the late R. C. Brown on the Council of the Medical Defence Association of Victoria in 1946, Sir John Newman-Morris was Vice-President and soon afterwards was made President. Here his guidance and management of the affairs of the Association were magnificent. He always sensed the implications of any action we would suggest, and, in combination with Mr. Heathfield, our legal adviser for over forty years, formed a wonderful protection for any of our members involved in litigation.

The profession owes much to three great presidents of the Medical Defence Association of Victoria: Dr. Murray Morton, the late Dr. L. S. Latham and Sir John Newman-Morris.

DR. H. C. COLVILLE writes: The British Medical Association and the medical profession generally have suffered a severe loss in the death of Sir John Newman-Morris. From his earliest years in practice he displayed a keen interest in medical politics, and he was elected to the Victorian Branch Council in 1918. When the position of Chairman of the Council was established in 1922, he became the first holder of that office, which he retained until 1939. As a Trustee of the Medical Society of Victoria he remained an ex-officio member of the Council up to the time of his death. He was one of the Victorian representatives on the old Federal Committee, and in 1933 he was one of the original signatories of the document creating the Federal Council of the British Medical Association in Australia, and he was a member of that body until 1939.

This brief statement of Sir John Newman-Morris's years of service to the Association can convey little of the quality of that service, as it was so well known to those of his colleagues who had the good fortune to serve in close

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED APRIL 13, 1957.<sup>1</sup>

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism .. ..	..	1(1)	2	1	2	..	..	..	6
Amoebiasis .. ..	..	..	..	..	1	..	..	..	1
Ancylostomiasis .. ..	10	..	7(7)	..	..	..	..	..	17
Anthrax .. ..	..	..	..	..	..	..	..	..	..
Bilharzias .. ..	..	..	..	..	..	..	..	..	..
Brucellosis .. ..	..	..	..	..	..	..	..	..	..
Cholera .. ..	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus) .. ..	1(1)	..	..	..	..	..	..	..	1
Dengue .. ..	..	..	..	..	..	..	..	..	..
Diarrhoea (Infantile) .. ..	4(4)	8(8)	1(1)	..	..	..	1	..	14
Diphtheria .. ..	..	..	1	..	..	2(1)	..	..	3
Dysentery (Bacillary) .. ..	..	11(11)	..	1(1)	2(2)	..	1	..	15
Encephalitis .. ..	..	..	..	..	..	..	..	..	..
Flariasis .. ..	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice .. ..	..	..	..	..	..	..	..	..	..
Hydatid .. ..	..	..	..	..	..	..	..	..	..
Infective Hepatitis .. ..	47(17)	21(7)	..	9(6)	2(1)	5(3)	1	..	85
Lead Poisoning .. ..	..	..	..	..	..	..	..	..	..
Leprosy .. ..	..	..	..	..	..	..	2	..	2
Leptospirosis .. ..	..	..	4	..	..	..	..	..	4
Malaria .. ..	..	..	..	..	..	..	2	..	2
Meningococcal Infection .. ..	3	4(4)	..	..	..	..	..	..	7
Ophthalmia .. ..	..	..	..	..	..	..	20	..	20
Ornithosis .. ..	..	..	..	..	..	..	..	..	..
Paratyphoid .. ..	..	..	..	..	1(1)	..	..	..	1
Plague .. ..	..	..	..	..	..	..	..	..	..
Polio-myelitis .. ..	3(1)	1	..	3(1)	1	..	..	..	8
Puerperal Fever .. ..	..	..	..	..	..	..	..	..	..
Rubella .. ..	..	13(10)	..	25(10)	1(1)	..	..	..	42
Salmonella Infection .. ..	..	..	..	..	..	..	..	..	..
Scarlet Fever .. ..	11(5)	22(9)	4(1)	10(7)	1(1)	..	..	..	48
Smallpox .. ..	..	..	..	..	..	..	..	..	..
Tetanus .. ..	..	..	..	..	..	..	..	..	..
Trachoma .. ..	..	..	..	..	1	..	..	..	1
Trichinosis .. ..	..	..	..	..	..	..	..	..	..
Tuberculosis .. ..	33(21)	10(9)	12(3)	8(6)	8(6)	4(1)	..	..	75
Typhoid Fever .. ..	1	..	..	..	..	..	..	..	1
Typhus (Flea-, Mite- and Tick-borne) .. ..	..	..	1	..	1(1)	..	..	..	2
Typhus (Louse-borne) .. ..	..	..	..	..	..	..	..	..	..
Yellow Fever .. ..	..	..	..	..	..	..	..	..	..

<sup>1</sup> Figures in parentheses are those for the metropolitan area.

association with him. To them, perhaps the outstanding impressions of his long and distinguished career were those of his great wisdom, his appreciation of all the facets of the problems which confront the medical profession and, above all, his meticulous regard for the highest standards of medical ethics. These qualities, displayed over the years, gradually led to his being accepted as the undisputed leader of the Victorian Branch of the Association, and his choice as President of the Eighth Session of Congress in Melbourne in 1952 was practically automatic.

If a personal note is permissible from one who had the unenviable task of succeeding him both as a member of the Federal Council and as Chairman of the Branch Council in 1939, I would like to place on record my appreciation of the advice and help which I received from Sir John in carrying out the duties of those offices; when the difficult or the unexpected cropped up, it became the natural thing to consult him for enlightenment, and the approach was never in vain. History will assess the value of the services rendered to the Association by Sir John Newman-Morris; the memory of those services will for many years be an inspiration to those who must follow in his footsteps.

## Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

### Examination Results.

THE Post-Graduate Committee in Medicine in the University of Sydney announces that the undermentioned candidates satisfied the examiners at the recent examinations for Part I of the various medical diplomas of the University of Sydney as shown:

Anæsthesia: Loraine C. Hibbard.

Dermatological Medicine: L. J. Cains, H. P. Coats, B. Florance, E. Kocsard, J. R. Tonkin, L. S. Wallman.

Gynæcology and obstetrics: J. G. Harrington.

Laryngology and oto-rhinology: J. H. Lancken, B. B. Sheaves.

Ophthalmology: J. B. Carpenter, P. H. Pickering.

Psychological medicine: D. S. Bell, J. A. C. Brassil, N. T. Yeomans.

Diagnostic radiology: J. T. Cullen, E. A. Jackson, S. W. Lush, Barbara S. Read, J. Saxton, R. W. G. Thompson.

Therapeutic radiology: D. P. Ewing.

The following candidates were successful in passing the recent examinations for the diploma in clinical pathology: Group I: J. B. Blackwell, C. J. McDonald. Group II: Tatiana Jelhovskiy. Group III: J. B. Blackwell.

## Nominations and Elections.

THE undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Goldberg, Azon, Regional Registration for Snowy Mountains Region, Kenny's Knob, via Cabramurra, New South Wales.

The undermentioned have been elected members of the New South Wales Branch of the British Medical Association: Bune, Hilda Dorothy, M.B., B.S., 1957 (Univ. Sydney); Levick, William Russell, M.B., B.S., 1957 (Univ. Sydney); Allen, Eric Abbott, M.B., B.S., 1956 (Univ. Sydney); Cabrera, Kenneth Francis, M.B., B.S., 1956 (Univ. Sydney); Barnes, Jack Felstead, M.B., B.S., 1954 (Univ. Sydney); Bell, John Michael, M.B., B.S., 1955 (Univ. Sydney); Blomley, Jack, M.B., B.S., 1953 (Univ. Sydney); Frith, Mary Eileen, M.B., B.S., 1954 (Univ. Sydney); Griffiths, Nancy Olive, M.B., B.S., 1942 (Univ. Adelaide); Pawloff, Theodora (licensed under Section 21B of the *Medical Practitioners Act*, 1938-1955).

The following have applied for election as members of the South Australian Branch of the British Medical Association:

Zacharia, William Vassalle, M.B., B.S., 1955 (Univ. Adelaide), 32 Fairford Street, Unley, South Australia.

Begg, Malcolm William, M.B., B.S., 1955 (Univ. Adelaide), 28 Park Terrace, Eastwood, South Australia.

The undermentioned have been elected as members of the South Australian Branch of the British Medical Association: Wurfel, Lois Jessie, M.B., B.S., 1954 (Univ. Adelaide); Kennedy, Desmond Anthony, M.B., B.S., 1954 (Univ. Adelaide); McDonald, John Gregory, M.B., B.S., 1955 (Univ. Adelaide); Penna, Lois Rosemary, M.B., Ch.B., 1955 (Univ. Manchester).

## Deaths.

THE following deaths have been announced:

BRADY.—Gerald Francis Brady, on April 13, 1957, at Kallangur, Queensland.

O'LOUGHLIN.—Irene May O'Loughlin, on April 16, 1957, at Adelaide.

HARRIS.—John Harris, on April 19, 1957, at Sydney.

## Diary for the Month.

MAY 7.—New South Wales Branch, B.M.A.: Organization and Science Committee.

MAY 10.—Tasmanian Branch, B.M.A.: Branch Council.

MAY 10.—Queensland Branch, B.M.A.: Council Meeting.

MAY 13.—Victorian Branch, B.M.A.: Finance Subcommittee.

## Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

**New South Wales Branch** (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

**Queensland Branch** (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

**South Australian Branch** (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

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